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BY C. M. HINDS-HOWELL, D.M. OXF., F.R.C.P. LOND.,
PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL AND THE NATIONAL HOSPITAL, QUEEN-SQUARE.

INJURIES of the head take a prominent place among traumatic causes of nervous disorders, and it is worth while to study them in some detail. A severe blow on the head, whatever its origin, may produce the symptoms of concussion or of cerebral compression. It may cause no anatomical damage on the one hand, or on the other it may give rise to fracture of the skull, hæmorrhage, or contusion of the brain. Depressed fractures or perforating wounds may in addition cause laceration of the cerebral tissues.

Simple concussion results in loss of consciousness of a quite transient character. In any case where loss of consciousness is prolonged it is safe to assume that something more than simple concussion has occurred, and that there has at least been some contusion of the brain, with or without serious hæmorrhage. It is very important to recognise the site of this hæmorrhage. It may be extradural, e.g., when the middle meningeal artery is ruptured, subdural, or subarachnoid.

In *extradural hæmorrhage* with concussion the patient regains consciousness and there is then a period in which symptoms may be slight or non-existent. Where symptoms of concussion are absent there may at first be nothing to indicate anything serious; then after a longer or shorter period, known as the lucid interval, evidence of pressure appears, which may be manifest in focal symptoms alone, or progress with continuing hæmorrhage to the full picture of cerebral compression. Such symptoms are quite familiar: unconsciousness deepening into coma, bounding pulse, rising blood pressure, pupils usually dilated, and stertorous respiration. Death follows inevitably from respiratory failure unless relief from the compression is obtained.

The following case illustrates the effect of a small extradural hæmorrhage:—

A young man, aged 20, was playing cricket and while batting was hit on the left temple. He was not so seriously damaged at the time as to stop his innings, for he was able to resume it after a few minutes. The same evening he developed a severe headache and vomited. Two days later he had a typical Jacksonian fit limited to the right face. During the attack he was unable to speak. He consulted me about this and while in my room had a similar attack which lasted about five minutes. One could feel nothing on palpating the injured area, but at operation a fracture of the saucer variety was found and an extradural blood clot. The dura was opened but there was no subdural hæmorrhage and no evidence of contusion. I thought the patient, who made a good recovery after operation, was cured, but six months later he had two generalised epileptic fits. He was put on a course of bromide and remained free from further fits. I am sure the mistake I made in this case was the omission to put the patient on bromide directly after his operation, and in any similar condition I am sure that this would be a wise precaution.

In extradural hæmorrhage the lucid interval to which I have referred, when present, is very characteristic, and signs of a focal lesion in the brain are often present. It must be noted, however, that the lucid interval may be absent or of exceedingly short duration.

Jonathan Hutchinson described dilatation of the pupil as occurring on the homolateral side in the majority of cases of extradural hæmorrhage. That it may be seen at times is certain, but Bathe Rawling, in his book, the "Surgery of the Skull and Brain," states that in his cases the pupils were equally dilated in 46 per cent., constricted on the homolateral side in 36 per cent., and only dilated on the homolateral side in 18 per cent. Von Bergman's figures, quoted by Rawling, showed 30 per cent., with a Hutchinson pupil in 70 cases. In 56 per cent. both pupils were equally dilated.

Subdural and Subarachnoid Hæmorrhages.

When there is subdural or subarachnoid hæmorrhage the injury to the skull has nearly always been severe and there is often a fracture. The venous sinuses may be torn through, and hæmorrhage from superficial cerebral vessels may occur. The brain is often contused or lacerated as well. Under these circumstances the clinical picture is likely to differ materially from that of uncomplicated cases of extradural hæmorrhage.

As the blood usually diffuses freely through the subdural space focal symptoms are rare as compared with cases of extradural hæmorrhage, and symptoms of cerebral irritation and compression are early. The lucid interval which we have seen may be a characteristic of extradural hæmorrhage, is often absent or very short.

A very interesting condition is localised subdural hæmatoma. The cases in which this occurs are often those in which the head injury has appeared to be comparatively trivial. After the initial shock the patient seems to recover, but usually not completely. One is often told by relatives that the patient "never seemed to get quite right." But after a period varying from a few days to several weeks symptoms of a focal lesion begin to make their appearance, in addition to those of headache, irritability, giddiness, which may be already present. Gradually the symptoms of increasing cerebral compression develop, and unless they are relieved by operation the patient becomes comatose and dies.

The following case,[1] which was under my care and which was operated on by Mr. Paterson Ross at St. Bartholomew's, well illustrates several important points in connexion with this type of case.

A man, aged 64, was on August 23rd, 1927, knocked down by a bicycle. He was concussed and taken to the Royal Northern Hospital. He was detained but as he appeared quite well and no fracture of the skull was discovered, he was discharged a few days later. In mid-September he became lethargic and had difficulty in walking and by the end of September was unable to walk. On Oct. 10th he had an attack of vomiting with severe headache and thereafter became unable to feed himself. I saw him on this date and got him admitted under my care at St. Bartholomew's Hospital at once. His condition there varied from a semi-comatose state to complete consciousness and his physical signs varied as well. He had, however, a constant degree of right-sided hemiplegia with extensor plantar reflex on the right, flexor on the left. The leg was more affected than the arm.

On account of the long latent period a diagnosis of localised subdural hæmatoma was clearly established. Mr. Ross operated on the left side and found beneath a discoloured dura the typical blood clot, enclosed in its characteristic membrane, extending over almost the whole hemisphere. This he evacuated, finding the cortex depressed beneath it. Next day the patient was much more conscious and could move his right leg better than before operation. He relapsed, however, and again became unconscious 24 hours after the

* A paper read before the Colchester Medical Society.

[1] Reported by J. P. Ross, St. Bart.'s Hosp. Rep., 1928, lxi., 112.

operation. In the belief that a further hæmorrhage had occurred the wound was reopened. No hæmorrhage was found, but it was noted that the depressed brain had not expanded. After this he gradually sank and died on the third day after operation. At the post-mortem a second and even larger hæmatoma was found on the opposite side of the brain. It was very remarkable that this second hæmatoma had seemingly caused no physical signs.

At that time I was unaware that the condition is frequently bilateral, but I now know that this is more often so than not. A small trephine opening should always be made on the opposite side, when the appearance of the dura will enable the presence or absence of a hæmatoma to be determined.

Injury of the brain tissue may take place without serious hæmorrhage, and usually on the side opposite to the site of injury. Coutrecoup is no doubt the explanation of this. Concussion followed by cerebral irritation and perhaps by symptoms of compression due to cerebral œdema is likely to occur. Paralysis may of course be present, depending on the site of the injury. If so, it will come on immediately after the injury, a fact which will serve to distinguish a primary brain lesion from an extra- or subdural hæmorrhage.

These cases of head injury present many difficult problems. The clear-cut difference between extra- and subdural hæmorrhage is commonly obscured owing to the presence of both, and the development of cerebral œdema may complicate the diagnosis where no hæmorrhage has taken place. Lumbar puncture should always be performed, for it may give important information in connexion with diagnosis, and is also a helpful therapeutic measure. Wherever there has been a considerable subarachnoid hæmorrhage the cerebro-spinal fluid will contain a large quantity of blood.

The pressure of the cerebro-spinal fluid should also be measured, for with increasing intracranial pressure the pressure of the cerebro-spinal fluid rises. The great danger in severe cases of head injury is from this increasing cerebral compression, due as often to contusion and œdema of the brain as to hæmorrhage. When the indications of a focal hæmorrhage are clear, and where it is impossible to combat the increasing compression by other measures, an operation should be undertaken. But I want particularly to emphasise the fact that cases in which there is a localised hæmorrhage which can be successfully treated by operation are few and far between. They are immensely outnumbered by those cases in which surgery, if attempted, is more likely to lead to disaster than to improvement. Careful nursing and the judicious use of such measures as lumbar puncture and the intravenous injections of hypertonic saline (30 c.cm. of a 30 per cent. solution) will usually prove more helpful than surgical intervention.

Speaking generally, it will be found that there is a number of factors which play an important part in the subsequent course of any particular case. Age is one of these. The young and the old are most liable to serious after-effects following severe injuries to the head. In the case of the young, mental development may be interfered with, whilst in the old, recuperative powers are heavily handicapped. The financial position of the patient is obviously another factor of great importance, for anxiety about the future and family responsibilities are bound to retard recovery, especially in patients of a worrying disposition.

Another most important factor is the immediate treatment which the patient receives. It is of the first importance that he should not be allowed to get up, nor return to work too soon. The medical attendant should err on the side of caution in this. If this precaution is not observed the probability of relapse associated with headache, irritability, and so on is greatly increased.

Remote Effects of Head Injury.

The remote effects of injury form a very important group, the more prominent members of which are paralysis, epilepsy, mental disorder ranging from insanity at one end of the scale, to impairment of memory and irritability of temper at the other, including also severe headache and the group of symptoms to which the unfortunate term traumatic neurasthenia has been applied. Let us examine some of these more closely.

TRAUMATIC EPILEPSY.

It is a well-established observation that epilepsy may be a sequel to severe head injuries. The attacks may be of the frankly Jacksonian type or they may assume the guise of the common so-called idiopathic variety, with grand mal and petit mal attacks. It is important to recognise also the epileptic equivalents such as vertigo, attacks of uncontrollable temper, memory lapses, and the like, to which Aldren Turner has called attention. These are likely to come on in the period between the injury and the manifestation of the fully developed epileptic attack. Vertigo is a symptom particularly common during this period, as has been pointed out by W. E. Stevenson.[2]

The period elapsing between the injury and the first fit varies very much. In my student days the opinion rather held the field that unless a fit occurred within a few months at most after the injury it could not properly be referred to the accident. But well-recorded cases are not uncommon in which epilepsy has developed as long as 12 years after a gunshot wound of the head, and in which the patient has been cured by the removal of the cicatrix. O. Foerster and W. Penfield[3] have recorded observations of great interest in this connexion.

It is important to remember that injury to *any part* of the brain may cause epilepsy, and that the particular type of fit often gives the clue to the area which has been injured. I mention this because of a case in which I was concerned which came into court.

The plaintiff, a bargee, fell down the hold of his barge. He struck the back of his head and was picked up concussed. There was a severe contusion over the occiput, but no fracture of the skull was discovered. In the course of the next few weeks he had his first epileptic attack which was followed by others. I advanced the view that the injury to his head was probably the cause of his fits. The doctor who appeared for the defendants said that this was impossible as it was well established that only injuries to the motor cortex could give rise to epilepsy. The medical referee took the same view and the man lost his case.

Comment is needless but this incident is an example among many others of the very unsatisfactory ways of medical referees and the absurdity of the present state of affairs with regard to medical evidence in compensation cases.

It is, as I have said, established that head injuries may give rise to epilepsy, but it is not so clear as to what kind of injury is a necessary antecedent. We know that injuries to the brain which cause a cicatrix are possible sources of epilepsy; so too are collections of blood either subdural or extradural. Pressure from a depressed fracture is another possible cause. The cicatricial group are likely to give fits after a more or less long interval, the hæmorrhages and foreign bodies (i.e., depressed bone) after a shorter one.

[2] Brain, vol. liv., p. 214.
[3] Ibid., vol. lv., p. 99.

Can concussion with no evidence of gross damage to the brain, fracture, or hæmorrhage act as an excitant of epilepsy? The balance of opinion seems to be that it can, but in such a case it seems likely that there is an individual predisposition to epilepsy. Alcoholism is, I am sure, definitely a predisposing condition. Severe emotional shock, which may be associated with the injury, may also be a factor in the development of epilepsy in a person predisposed by heredity, habits, or psychological constitution.

SO-CALLED TRAUMATIC NEURASTHENIA.

There is a number of symptoms commonly met with after a severe head injury which may be the direct result of the physical injury, or manifestations of neurasthenia, which I regard as being a psychological disorder. Such are headache, irritability, memory impairment, difficulty in concentration, limitation of mental capacity, and so on. In trying to assess the significance of the symptoms, the severity of the injury, the patient's age, social position, and past record are all helpful.

The term traumatic neurasthenia has been given to this group of symptoms, and in my opinion most unfortunately. The name suggests that a definite disease has followed as the result of the injury, a particular type of neurasthenia peculiar to a person who has been injured. This is quite untrue. Traumatic neurasthenia differs in no way from any other kind of neurasthenia. Moreover, the development of this condition does not depend on the severity of the injury; it is, indeed, as likely to follow a minor injury, or no physical injury at all, as it is to supervene after serious physical disablement. If one carries one's mind back to the effect of injuries in the late war the very significant fact emerges that those who received a wound which from its severity took them away from the war for good rarely developed traumatic neurasthenia, whilst this was a common sequel to many much more trivial injuries.

So-called traumatic neurasthenia is rare except in those who are going to benefit from it. It usually takes some weeks to develop and in this latent period many psychological factors are at work; possibly ill-advised expressions of opinion by the doctor, the opinions of friends and sympathisers, the wholly criminal attentions of a certain class of touts offering legal aid, and the provisions of the Workmen's Compensation Act—all conspire to produce the condition. I am certain, if this Act had been limited to compensation for physical injuries and limited as to the duration period of the compensation, that traumatic neurasthenia would be a rare disorder.

The Spinal Cord.

I must now refer briefly to the effect of trauma on the spinal cord. Severe injuries causing fracture dislocations by direct violence are often followed by paraplegia. In most cases the cord is pulped by the damaged vertebra. There is complete motor paralysis, usually, in the early period after the injury, of a flaccid type with absence of tendon reflexes as the result of shock. The plantar reflexes may also be absent, but, if present, will be of the extensor type. There will be loss of all forms of sensation terminating in a sharply defined sensory level corresponding with the segment of the cord at the site of the injury. There will be retention of urine, an important point to remember since catheters must be passed at regular intervals or the bladder will become over-distended, a condition which adds to the risk of cystitis.

In dealing with such a case no operative interference should be contemplated until the period of shock has passed off. When this takes place improvement frequently occurs to a remarkable extent, unless the cord has been irretrievably damaged. Unfortunately regeneration of nerve-fibres does not take place within the spinal cord, probably because of the absence of the neurilemmal sheath which plays so prominent a part in the regeneration of peripheral nerves. Surgery can only remove any pressure which there may be on the cord from displaced bone, &c., One is always inclined to give the patient the slender chance of improvement which surgery holds out, but in my experience it is exceptional for any benefit to ensue from it.

Apart from damage as the result of direct injury, there may be hæmorrhage from indirect violence. This may be either external to or within the spinal cord. In the latter case a common site for such hæmorrhage is the cervical enlargement, when symptoms similar to those presented by a case of syringomyelia (at any rate from the motor and sensory aspect) are probable. Hæmorrhage chiefly outside the cord will usually give rise to weakness, from pressure on the anterior roots, and pain, from irritation of the posterior roots. Possibly concussion of the cord may add its part to the clinical picture, though this is more speculative.

The following case is illustrative of the symptoms following a fall from a polo pony:—

On April 12th an officer had a "crash" when playing polo. He was more or less unconsciousness for 12 hours, so he evidently sustained some cerebral contusion. On recovering consciousness both arms were completely paralysed, but he could move his legs. Both arms were painful and extremely hyperæsthetic. There was no loss of sphincter control. He was kept in bed for three weeks by which time there was some return of power in both arms, but he was still unable to shave.

I saw him three months after his accident. He complained of stiffness in movements of his neck, but no fracture had been detected. His arms had recovered a considerable degree of power but flexion and extension of the elbow were very poorly performed, especially on the left side. There was still hyperæsthesia in both arms. Sometimes when bending his neck or coughing or sneezing he would get widespread paræsthesia all over his body below his neck. The arm reflexes were brisk, abdominal reflexes present, knee- and ankle-jerks very brisk, ankle-clonus and extensor plantar reflexes on both sides. There were no headaches or other cerebral symptoms.

He ultimately made a complete recovery and was able to remain on the active list. In this case there must have been hæmorrhage outside the cord in the cervical region which produced pressure effects at that level. The symptoms of root irritation were very marked.

CIRCUMSCRIBED SEROUS MENINGITIS.

There are cases in which an injury to the spine, which may at the time appear comparatively trivial, ultimately gives rise to a slowly progressive paraplegia. Sir Victor Horsley many years ago first drew attention to this possibility, to which the name meningitis serosa circumscripta has been given. It is a condition in which adhesions appear to form in the subarachnoid space, as the result of which the cerebro-spinal fluid becomes collected in a cyst-like manner. I have always found it difficult to understand the exact mechanism of this as it is, I think, remarkable that under these circumstances a fluid cyst with increasing pressure should form.

The appearances at operation are very characteristic, as the dura is found to be tense and the subarachnoid space distended with fluid compressing the cord. As soon as the arachnoid is punctured the fluid escapes with a gush and thereafter the symptoms of compression of the cord are relieved.

A case of the kind which I had under my care was that of a boy aged about 20 who fell backwards over the back of

a seat. He ricked his back at the time but was not laid up with it though he complained of severe pain for some days. About nine months afterwards he began to experience progressive disability in his legs, and ultimately developed a definite paraplegia with a sensory level, but without complete loss of sensation below this level. At operation a condition of affairs similar to that to which I have referred was found, and the boy ultimately made a good recovery.

INJURIES OF PLEXUSES.

The brachial plexus from its position is peculiarly liable to injury and it is exposed to risk very early in life. The danger to it is well known in cases of transverse presentation with a prolapsed arm. In such cases the upper roots of the plexus (C. 5, 6, and 7) are those chiefly exposed to injury and the lower roots from their more protected position are less likely to suffer.

A grave danger in cases of severe injury, for example from a fall, is that the roots may be torn out of the cord. This seems more likely to happen than rupture of the cords of the plexus itself. The first case which I saw of this impressed me very much.

A farmer weighing 16 st. was returning from market where he had certainly had some alcoholic refreshment. He was driving a dog-cart and fell out of this on to the road. The right side of his head and his right shoulder appear to have shared the force of his fall. His right arm was completely paralysed at first, flaccid, with absent reflexes and complete loss of sensation. Gradually the muscles supplied by the lower roots recovered, but there was absolutely no recovery in those supplied by the fifth, sixth, and seventh cervical roots. An exploratory operation was performed, and it was found that these roots had been torn out of the cord. An attempt was made to graft the damaged roots into the lower cords of the plexus, but without success.

Unless the cords of the plexus are ruptured or evulsed recovery follows in due course after injury, and this fortunately is the more common experience. As an example a man came under my care who had been injured in a rather unusual way.

He had taken two mastiffs for a walk, each on a separate lead. The mastiffs saw a cat and gave chase, taking their leader with them. They came on a lamp-post, one dog passing it on either side, and the unfortunate man, still holding on to his obstreperous charges, struck the lamp-post with the root of his neck. Paralysis of the upper brachial plexus type supervened, from which he recovered without operation.

The lumbo-sacral plexus is much less exposed to direct injury than the brachial plexus. There is an interesting though fortunately rare condition in which the lumbo-sacral cord sustains damage in the mother during childbirth. I have seen several such cases and wrote a short account of three in the *St. Bartholomew's Hospital Reports* for 1908. Within a few days following confinement the patient complains of severe pains in her leg, the particular leg affected depending probably on the position of the fœtus. The labour is likely to have been difficult and prolonged. There follows almost at once paralysis of the muscles supplied by the external popliteal nerve, whilst those supplied by the internal popliteal are affected to a much less extent. As a result there is foot-drop with loss of eversion of the foot, whilst plantar flexion is weak. The knee-jerk is brisker than on the sound side; the ankle and plantar reflexes are absent. Flexion of the knee may be weak, extension is well performed. Some sensory loss is present in the area of the fourth and fifth lumbar roots and the first sacral. In the cases I have observed improvement has taken place but recovery has never been complete. The delay between delivery and the development of symptoms (i.e., from two to nine days) suggests that some other factor besides trauma must play a part. This may be an inflammation, but in the cases I have observed there has been no rise of temperature and no evident sepsis.

General Nervous Disorders.

I will now pass on to consider trauma as it may affect certain general disorders of the nervous system.

There is, I am sure, no doubt that an injury may be the determining factor in the development of symptoms of latent organic disease. Thus the symptoms of syphilis of the nervous system may undoubtedly be unmasked by physical injury or shock.

Some years ago I was asked to give evidence in Court in a case which was brought by the driver of a horse 'bus against his employer. The man had been in regular work and apparently in good health until he was thrown from his box to the ground by his horse starting before he was securely seated. He was very much shaken by this and was taken home. He remained in bed for two or three days and when he got up was very unsteady on his legs. Examination showed a fully developed picture of tabes dorsalis. The case came into Court and I pointed out that the cause of tabes was something quite different from a fall off a 'bus. A very junior doctor who appeared for the plaintiff read a passage from Osler in which it was stated that trauma was an occasional cause of tabes. The 'bus driver won his case and certainly the joke was against me for the doctor for the plaintiff who had quoted Osler with so much success had just completed his time as my house physician.

Now although no amount of falls from 'buses will give anyone tabes dorsalis, it is certain that such an accident may precipitate the development of symptoms. In a similar way I have had more than one case in which the symptoms of general paralysis have developed following the shock of injury—not necessarily a head injury.

Another type of case in which injury may at any rate precipitate the development of symptoms is paralysis agitans.

A man, aged 52, a carpenter, was at work on a building and fell through a ceiling, sustaining a bad fracture of the humerus. It was set in a bad position in the first instance and had to be broken down and reset at St. Bartholomew's Hospital. As the time for this man's discharge approached I was asked to see him as he had developed a tremor. I found him with well-marked signs of paralysis agitans, already so severe as to prevent him resuming his employment. Before his accident he had no symptoms whatever of the disease. The conclusion is, I submit, irresistible, that the shock of his accident, mental and physical as it had been, was responsible for the development of his symptoms.

The evidence is not so clear in the case of such a disease as amyotrophic lateral sclerosis. This is fortunately not very common, but anyone who goes carefully into the history of these cases will find in a certain number of them a history of physical shock of some kind. We do not know anything very definite with regard to the ætiology of this disease, and Gowers's view of "abiotrophy"—an inherent lack of vitality in the motor cells of the cortex and spinal cord—has at least not been disproved. It is at any rate intelligible that a shock to the nervous system may prejudice the vitality of cells in which the vital spark is already burning low.

MEMORIAL TO A BELFAST PHYSICIAN.—Last week a memorial tablet to the late Dr. H. L. McKisack was unveiled at the entrance to one of the wards of the Royal Victoria Hospital, Belfast. The tablet bears the following inscription:—"To Henry Lawrence McKisack, M.D., F.R.C.P.—1859-1928—who gave his services to this Hospital from 1895 to 1924, and in his labours here, and beyond these walls, won the affection and gratitude of many." A sum of £618 has been subscribed to form the nucleus of a fund for original research in medicine and surgery.

OBSERVATIONS ON THE USE OF NEMBUTAL AND CHLORAL IN CHILDBIRTH.

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THE use of sedative drugs to relieve the pains of labour has long been of universal interest. Many drugs and combinations of drugs have been tried but none has yet been widely accepted.

Chloral was introduced as a mild hypnotic by Oscar Liebreich in 1869. It has been used extensively for its sedative effects but given alone it does not produce a painless labour. The morphia and scopolamine combination was introduced by von Schneiderlin in 1899; it was used in midwifery by von Steinbuchel in 1902 in the first determined attempt to produce a painless labour and was popularised by the publication of a large series of cases by C. J. Gauss (1906). In the opinion of many, however, the disadvantages of this combination outweigh the advantages. The method introduced by J. T. Gwathmey has been successful in the hands of experts.[1] Avertin does not produce a painless labour, because its action seldom lasts more than one and a half hours (J. M. Connell[2]). Paraldehyde was tried recently by one of us (J. V. O'S.). It was given rectally in doses of up to one drachm to the stone weight of the patient. The best time to administer the drug was when the os uteri was between two-fifths to three-fifths dilated in primiparæ and when labour had started in multiparæ. The drug was always freshly prepared before use, but even so was too irritating to be given undiluted. At first the paraldehyde was diluted with ten times its own quantity of water, but in this case the bulk was too great to allow of a sufficient dose to be given. Next the drug was diluted 1 in 3 with olive oil. Though a few successes were obtained paraldehyde by rectal administration was given up in favour of nembutal and chloral, because in the majority of cases the drug acted as an enema and this tendency could not be satisfactorily overcome. Recently barbiturates have been used by various workers as analgesics in midwifery, but the results to date are conflicting. Nembutal[3] has been given by the mouth, but we can find no report of its routine administration in childbirth.

We have experimented with a combination of nembutal and chloral given by the mouth. This innovation was undertaken because, in the opinion of many, there was not a suitable combination of drugs which could be given with ease in general practice to women in labour. The combination of nembutal and chloral for oral administration has not, to our knowledge, been used before as a method of relieving the pains of labour. We present the records of 60 consecutive cases treated at the London Hospital in the wards of Mr. Eardley Holland and Mr. Victor Lack. It is our opinion that the results obtained show many advantages over the existing forms of analgesia in midwifery.

Nembutal is a recently introduced barbituric acid derivative (sodium-ethyl-methyl-butyl barbiturate) which hydrolyses on keeping, and is therefore put up in gelatin-coated capsules (grs. 1½ in each). It has the characteristic hypnotic properties of barbiturates though, as nembutal is rapidly excreted, the sleep is shorter than that produced by many others. Recovery from the drug takes place in about four hours. Nembutal is said to cause restlessness less often than other barbiturates.

Chloral hydrate is well known as a hypnotic. We gave it in grs. 30 doses in 3 oz. of freshly prepared home-made lemonade sweetened with three to four teaspoonfuls of sugar. This was necessary to overcome the bitter and unpalatable taste of the drug.

Method of Administration.

Selection of cases.—In our series of 60 consecutive cases we found no contra-indications. The combination of nembutal and chloral was given successfully in cases of test labour and in cases complicated by heart disease and albuminuria.

Environment.—Routine examination of the patient should precede the administration of the drug. The room should be dimly lighted and quiet. A nurse should be in constant attendance, although many of our patients were left unattended from periods varying from 15 to 30 minutes.

Time of administration.—The initial dose should be given to a primipara when the os uteri is two-fifths to three-fifths dilated and pains are occurring regularly; and to a multipara when the os is one-fifth to two-fifths dilated and regular pains are present. The drugs are to be given by the mouth only. A total dose of nembutal grs. 7½ and chloral hydrate grs. 120 should not be exceeded in 12 hours. This total is reached by repeated single doses as follows: an initial dose of nembutal grs. 3 and chloral hydrate grs. 30; subsequent doses of nembutal grs. 1½ and chloral hydrate grs. 30. These drugs are not given simultaneously. The nembutal should always precede the chloral by ten minutes, because a lesser interval may excite vomiting. The first "repeat" dose is given two hours after the initial dose. Subsequent doses are given every three hours. The interval between doses should never exceed four hours; for when this period is exceeded amnesia is never complete.

Heart cases.—In heart cases to prevent the possibility of restlessness we advise that morphia gr. 1/8 be given hypodermically with the initial dose. The dose of morphia should not be repeated.

DIFFICULTIES.

The initial difficulties we met with may be described under the headings of dosage, vomiting, restlessness, and precautions.

Dosage.—As we did not know the power of the drugs and feared the effects on the mother and fœtus, we began by administering small amounts (an initial dose of nembutal grs. 1½ and chloral grs. 15) and incomplete amnesia resulted. Subsequently we increased the initial dose to nembutal grs. 4½ and chloral grs. 30, but found that this diminished the force and frequency of the uterine contractions. By experiment we found that the best initial dose was nembutal grs. 3 and chloral grs. 30. Too early administration tends to slow

[1] Amer. Jour. Obst. and Gyn., 1923, vi., 456; Surg., Gyn., and Obst., 1930, v., 190; Irish Jour. Med. Sci., April, 1931, p. 162.
[2] THE LANCET, 1930, ii., 184.
[3] Brit. Med. Jour., 1931, i., 358; THE LANCET, 1931, i., 74 and 586; Proc. Roy. Soc. Med. (Sect. Anæsth.), 1930, ix. 210.

down labour. Labour actually came to a complete standstill for 24 hours in a primipara to whom the drugs had been given as soon as pains had begun. Too late administration—e.g., an hour and a half before delivery—did not give the drugs time to act fully, and the four cases classified as failures come under this heading. The time interval between doses also had to be found. Our aim was to produce a continuous amnesia. With the doses given as above we found that if the interval exceeded four hours, interruption of amnesia resulted. The best interval for the first "repeat" dose was found by experiment to be two hours; for subsequent doses every three hours.

Vomiting occurred in our early cases and immediately followed the ingestion of the drugs. There was no vomiting when nembutal was taken alone, and it was prevented, firstly, by giving the drugs separately (eventually we found that a ten-minute interval sufficed) and secondly, by giving the chloral in smaller bulk, making it more palatable and causing the patient to sip it slowly.

Restlessness was noted in varying degree in 12 of our 60 cases. In ten the restlessness was slight. In two it was severe. One of these was a case of heart disease, in the other labour was normal. No patient became maniacal. Restlessness developed, either shortly after the administration before the full effects of the drugs had been established, or during the stages of recovery from the effects of the drug, if the patient was still in strong labour. In the former group no prevention was necessary as the excitement was always slight. In the latter group, if early in the second stage, the drugs were repeated in the doses recommended, or, if the head was crowning, a few whiffs of chloroform from a Junker's inhaler were given. Morphia gr. 1/12 to 1/6 was given in ten cases. Three of these were cases of heart disease, and it was given to prevent possible restlessness. In four it was given late in labour with the initial dose of nembutal and chloral. The remaining three were cases of prolonged test labour. Of the ten labours five were painless. In no case did restlessness occur after labour was completed.

Precautions.—No precautions were taken in our cases to exclude external sensory impulses. As a general rule the ward was not darkened, nor were the patients isolated apart from a screen around the bed. This procedure was unavoidable because of restricted accommodation. The labour ward was, of course, kept as quiet as possible, but this was difficult, because on many occasions two or three patients were in labour at the same time.

Clinical Effects of the Drugs.

The first effect of the drugs was a sensation of drowsiness which was followed by sleep. All the patients slept for varying periods after taking the drugs. Some awakened with the pains whilst others were only roused, and a few did not even move with the pains. Some patients were roused easily and could be made to talk and answer simple questions rationally though slowly. These patients usually had "islands of memory." Other patients were roused with difficulty, would answer questions very slowly, and then drop back to sleep whilst being questioned. A third group (two cases) could not be roused to answer any questions. These last two groups had no islands of memory. Only four patients were noisy and then only with the pains. Most patients slept for times varying from one to eight hours after delivery and awakened fresh and well. Respiration did not change in rate or depth. There was only one case of slight cyanosis, the cause of which we could not discover.

Cardiovascular system.—The pulse-rate did not alter. The blood pressure showed only slight variations between 5 and 10 mm. except in one case where it fell 25 mm. In this case the fall took place 15 minutes after the administration of the drug. The patient showed no signs of collapse or distress, and in an hour the pressure had regained its normal height.

Urinary system.—We had no case of retention or any other urinary trouble. This contrasts favourably with the morphia and scopolamine narcosis in which there is a tendency to retention.

Alimentary system.—The patients had no trouble with their bowels, and did not vomit at any time after delivery, nor had they any digestive upsets during the puerperium.

Central nervous system.—The pupils usually remained moderately dilated and reacted to light and accommodation. The conjunctival reflex was absent in several of our patients, and in two the corneal reflex was also absent. In four cases the patient had coarse nystagmoid movements on lateral fixation the following day, but these passed off within 12 hours. One patient had double vision for five hours. There were no other ocular disturbances. The tendon reflexes varied. In most cases they were unaltered, in some cases they were slightly increased or diminished, and in two cases they were absent. All reflexes returned when the patient awakened after delivery. Muscle tone, as a rule, was not interfered with, but in two cases the limb muscles were flaccid.

EFFECTS ON LABOUR.

First stage.—In 60 per cent. of our cases there was no lengthening of this stage. In the remaining 40 per cent. it was slightly prolonged but never excessively. It is interesting to note that in three cases of primary uterine inertia the pains were definitely stimulated in force and frequency after the drugs were administered.

Second stage.—In 50 per cent. of our cases there was no apparent lengthening of this stage. Labour advanced normally and the patient was able to bear down with the pains. In the other 50 per cent. there was a slight lengthening, and the bearing-down efforts were impaired. The average time of the second stage in the primipara was 2 hours and 36 minutes, in the multipara 1 hour and 30 minutes. In 20 cases we gave chloroform only with the crowning of the head. Of these 20 cases 13 were painless labours. Chloroform can be given by Junker's inhaler (the method we used) by the drop method, or in ampoules. From an analysis of our cases we note that forceps delivery was used in ten (one multipara and nine primiparæ). In two of these cases the use of forceps was indicated because the patients had rheumatic valvular disease of the heart, and in three others to terminate test labours, one of which we shall describe below (Case 3). In the remaining five cases forceps were applied for delay in the second stage, two of these being for unrotated posterior positions. A general anæsthetic of either gas-and-oxygen or ether was given in all ten cases. Pituitrin was given in two cases where the head was delayed at the vulva.

During the last two and a half years the forceps rate at the London Hospital was 13·4 per cent. In our 60 cases it was 16·6 per cent.

Third stage.—There was no prolongation, the average time being 17 minutes. In 54 cases the placenta was expelled spontaneously or expressed from the vagina without any excessive bleeding. Post-partum hæmorrhage occurred in six cases. Five of these were mild (average loss 15 to 20 oz.), one was severe (loss 30 to 40 oz.). Of the five mild cases three were immediate, two were delayed. In the two delayed cases the hæmorrhage occurred two to three hours after delivery. All the mild cases were controlled by fundal pressure and an injection of pituitrin and ergot. In the severe case there was a bicornuate uterus and a bipartite placenta which separated incompletely, one part remaining in the uterus and the other in the vagina.

EFFECTS ON THE FŒTUS AND PUERPERIUM.

We have given nembutal and chloral in 60 cases, many of them difficult labours, and in no case have we had a dead child. The babies in all but six cases were born healthy and of good colour, and cried lustily. Four of these six infants were born in apnœa and two in white asphyxia. The latter two were born in test labours. Two of the former had morphia. In all of these cases regular breathing was established within ten minutes.

The puerperium was normal in all but one case in which parametritis occurred. The milk flow was never disturbed and the babies throve during their stay in hospital.

Results.

The standard by which we determined our results was based on the statements made by the patients when questioned on the day after labour. These results were as follows:—

(*a*) Painless labour	37 cases	62	per cent.
(*b*) Very good result	13 „	21	„
(*c*) Good result	6 „	10	„
(*d*) Failure	4 „	7	„
Total	60 „	100	„

(*a*) Complete amnesia. (*b*) Very good results when the patient had vague recollection of a few incidents, such as the birth of the head. Many of these labours would undoubtedly have been completely painless if chloroform had been given during the birth of the head. (*c*) Good results, in which partial amnesia was present and when the intensity of the pains was diminished. (*d*) Failures, when the patient slept in the intervals between pains but remembered all her labour.

The following are examples to illustrate our results:—

CASE 1. *Painless labour.*—Aged 31. Three previous labours. Treatment was started when the os uteri was one-fifth to two-fifths dilated and the uterus was contracting regularly. The duration of the labour from the time of the giving of the drug was 8¼ hours. Nembutal grs. 6 and chloral grs. 90 were given during this period. The first stage lasted 9¼ hours and the second stage ¾ hour. The third state lasted 20 minutes. No post-partum hæmorrhage occurred. No restlessness. No choloroform was given. The baby was born healthy ahd cried at once. When asked the following day about her labour the patient could recollect nothing after taking the first dose of the drug.

CASE 2. *Painless labour.*—Aged 26. One previous labour. A case of twins. Treatment started when the os was two-fifths and regular pains were occurring. The initial doses of nembutal grs. 3 and chloral hydrate grs. 30 were given. Three "repeat" doses of nembutal grs. 1½ and chloral hydrate grs. 30 were administered. Patient slept between the pains. There was no restlessness. The first stage lasted 14 hours. The second stage lasted ¾ hour. Both babies were breech deliveries. Both babies were healthy and cried at once. There was no post-partum hæmorrhage. The total duration of labour from the time of the administration of the drugs was 10¾ hours. This patient awakened eight hours after her delivery, put her hand on her abdomen and said, "where are my babies?" She did not remember anything of her labour after the first dose.

CASE 3. *Painless labour.*—Aged 23. Primipara. Test labour at term. Small round pelvis. On Nov. 14th patient was examined under an anæsthetic and though there was slight overlap of the fœtal head it was thought that the head would mould through the pelvis. Surgical induction by pig's bladder at 8 P.M. was followed by some pains in a few hours. The next day the bladder was removed from the vagina and the os was found to be four-fifths. On Nov. 16th at 5 P.M. patient began to have definite pains. At 8 P.M. the pains were occurring 1 in every 5 minutes. Nembutal grs. 3 and chloral hydrate grs. 30 were given. At 10 P.M. morphia gr. 1/6 was injected to ensure deep sleep. On the 17th at 4 A.M. the os was full. Pains were moderate in force. The baby's head was still high but was slowly moulding through. The patient was sleeping soundly between pains. At 8.30 A.M. nembutal grs. 3 was given to the patient. At 1.30 nembutal grs. 1½ and chloral grs. 30 were given. At 2.30 P.M. patient was flaccid. There was no corneal reflex present. The uterus was contracting regularly. At 4 P.M. a mid forceps delivery was performed under gas and oxygen. The child was limp and feeble at first but recovered fully in 10 minutes. The third stage was completed in 15 minutes. There was no post-partum hæmorrhage. The total drugs given in this case were nembutal grs. 9, chloral hydrate grs. 90, and morphia gr. 1/6. Labour was completed 20 hours after the administration of the drug. The second stage lasted 12 hours. Next day the patient remembered nothing about her labour after the giving of the drugs. The patient had a normal puerperium and the baby was in excellent health on discharge from hospital three weeks after delivery.

CASE 4. *Very good result.*—Aged 29. Primipara. Labour lasted 17 hours. Total doses nembutal grs. 6 and chloral grs. 60. The first dose was given when the os uteri was three-fifths dilated. Patient slept soon after the administration of the drug. Patient remembered vaguely the pains towards the end of her labour but did not remember the birth of the head. She remembered a stitch being inserted into the perineum.

CASE 5. *Good result.*—Primipara. The drugs were given when the os uteri was three-fifths dilated. The total dose given was nembutal grs. 6 and chloral hydrate grs. 60 and chloroform during the birth of the head. There was no restlessness. The second stage lasted one hour and the third stage ten minutes. There was no post-partum hæmorrhage. When asked the following day patient said that she felt much better after the drug, but remembered the whole of the labour vaguely until the mask was put on her face when she remembered no more. Patient "would like to have the drug with the next baby." Baby cried lustily when born and was healthy on discharge from hospital.

CASE 6. *Failure.*—One child previously. The drugs were given late in labour when the os uteri was four-fifths dilated. The total drugs given were nembutal grs. 3, chloral hydrate grs. 30, and chloroform with the birth of the head. The baby was born 1¼ hours after taking the drug. There was no post-partum hæmorrhage. The drugs "quickened the pains and made them stronger." Patient was given chloroform with the birth of the head and she did not remember this part of the labour.

Conclusions.

(1) In our opinion this combination of drugs is safe and can be given to any woman in labour. (2) The drugs are easily portable and are given without trouble to the attendant or discomfort to the patient. (3) Judging by our experience the drugs may be administered by midwives but they must follow the technique carefully and never vary it without the direct permission of a medical practitioner. (4) In our series of 60 consecutive cases we have had 62 per cent. of painless labours without any ill-effects to mothers or children.

We would like to thank Mr. Eardley Holland for reading this paper and giving us the benefit of his criticism.

THE TREATMENT OF ANÆMIAS.*

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OUR knowledge of the ætiology and therefore of the treatment of anæmia has advanced rapidly during the last few years. We know something to-day both of the factors which are necessary for normal blood production and of those which can interfere with or inhibit it. Treatment therefore should have a rational basis if, in any given case, we can determine what essential principle is lacking or what interfering factor is present.

Normal hæmatopoiesis is dependent upon adequate supplies of: (1) iron, (2) copper, (3) at least two substances present in whole liver, (4) vitamin C, (5) some complex of vitamin B, and (6) secretion of the thyroid gland. A lack relative or absolute of one or more of these factors will produce anæmia. The deficiency, whether single or multiple, may be caused by faulty intake due to unbalanced diet, faulty digestion in the gastro-intestinal tract, faulty absorption from the intestines, faulty distribution through pathological blood-vessels, or excessive strain placed on the normal storage depôts by (*a*) sudden or chronic loss, such as hæmorrhage, or (*b*) increased demand, as in pregnancy (Ivy et al.).

IRON.

Iron is an essential constituent of the hæmoglobin molecule. Lack of iron, therefore, however brought about, will cause an anæmia which can be relieved by the suitable administration of iron. These iron-deficiency anæmias, which would in the past have been classified as secondary anæmias, are characterised by a low colour-index—since it is the hæmoglobin-building factor which is lacking—and red cells which are normal or smaller than normal in size. They are:—

1. Idiopathic microcytic or hypochromic anæmia, a group which includes the Plummer-Vinson syndrome—i.e., dysphagia associated with anæmia and splenic enlargement.
2. Anæmia following acute and chronic hæmorrhage.
3. The simple or nutritional anæmia of infancy.

Idiopathic microcytic anæmia has been extensively studied in this country by Witts. It occurs largely in young middle-aged women, a study of the age-incidence showing a steady increase to a maximum between 40–47. The history is usually vague. Breathlessness, weakness, indefinite gastric discomfort, possibly sore tongue and dysphagia are the usual complaints. Clinically the spleen is palpable in about one-third of the cases. The finger-nails may show a spoon-shaped deformity. Achlorhydria is common but not invariable. The van den Bergh reaction is negative. Such cases respond as dramatically to large doses of iron as pernicious anæmia does to liver.

The underlying cause of the deficiency of iron is not clear, though some of the factors already noted as being of importance may play their part. In some cases there is deficient absorption from the gastro-intestinal canal. Mettier and Minot (1931) have shown that iron is more readily absorbed from an acid than from an alkaline medium; Minot and Heath have more recently found that the reticulocyte response to iron is of less magnitude in cases with achlorhydria than in those with free acid, which suggests that faulty absorption dependent upon lack of acid secretion is of importance. Since typical cases occur with a normal acidity, achlorhydria cannot be sole cause any more than it is in pernicious anæmia. Davies suggests that the excess of mucous secretion found in these patients may exert an inhibitory effect on absorption.

Faulty distribution probably plays a part in some cases. The frequent occurrence of chronic scurvy and pellagra in patients with arterio-sclerosis led Mettier and Minot (1931) to suggest that faulty absorption through such abnormal vessels was a factor in the production of deficiency diseases. Such defective absorption by the vessels must lead to faulty distribution to the tissues. Certainly arterio-sclerosis, if present, limits the efficacy of treatment with both iron and liver, since it is necessary to give bigger doses of the missing factor to obtain the same result in arterio-sclerotic subjects.

Faulty diet leading to chronic iron starvation is also of importance. Inquiry into the dietary history almost always procures the same answer: meat and green vegetables, the chief iron-producing foods, have either from personal taste, fear of indigestion, poverty, or laziness been taken sparsely for a long period. However, as patients with pernicious anæmia must always take liver, so patients with idopathic microcytic anæmia in the majority of cases must continue to take iron indefinitely, suggesting that there is some fundamental defect in iron metabolism present, apart from the contributory causes discussed. (Davies; Witts.)

TABLE I.—*Hæmoglobin regeneration after gastric hæmorrhage in patients who received massive iron therapy.*

Patient.	Lesion.	Hb. % gain.	Duration of treatment in days.
1*	Gastric ulcer.	58	37
2*	Gastro-enterostomy or bleeding duodenal ulcer.	38	40
3	Duodenal ulcer.	38	42
4	Gastric ulcer.	54	48
Average		47	42

* Transfusion.

TABLE II.—*Hæmoglobin regeneration after gastric hæmorrhage in patients who did not receive massive iron therapy.*

Patient.	Lesion.	Hb. % gain.	Duration of treatment in days.
1	Duodenal ulcer.	18	49
2	" "	22	51
3	" "	22	52
4*	Gastric "	24	57
5	Duodenal "	0	73
6	Gastric "	56	100
7	" "	58	120
8	" "	44	129
Average		30	79

* Transfusion.

The influence of an iron-poor diet on hæmoglobin production is apparent after gastric *hæmorrhage*. A small group of patients having severe secondary anæmia after gastric hæmorrhage were given not less than grs. 60 of Blaud's pill, in powdered form, daily. The average gain of hæmoglobin was 47 per cent. in an average period of 42 days (Table I.). Two of these cases, as indicated, also received one or more blood transfusions as an emergency measure

* A paper read to the London Association of The Medical Women's Federation, on Dec. 15th, 1931.

immediately after hæmorrhage, but without apparently influencing the result. In one there had been no improvement in a previous period of 64 days in spite of transfusions and small doses of iron and arsenic. A control series of patients who did not receive adequate iron therapy had an average gain of 30 per cent. hæmoglobin in 79 days (Table II.). A similar difference was apparent in the length of time required for the red cells to reach a figure of 4,000,000 per c.mm. In the group receiving iron such a level was reached in 23 days as compared with 45 days in the control group (Table III.). It

TABLE III.—*Time required for red cells to reach 4,000,000 per c.mm.*

Patient.	Treatment.	Time in days.	Red cell increase per c.mm.
1*	Massive iron.	18	2,200,000
2*	" "	38	600,000
3	" "	18	1,500,000
4	" "	16	1,700,000
Average		23	1,500,000
3	Other treatment.	14	1,260,000
4*	" "	35	2,400,000
5	" "	37	1,280,000
6	" "	45	2,100,000
1	" "	49	2,600,000
2	" "	50	1,300,000
8	" "	62	2,580,000
7	" "	64	2,100,000
Average		45	1,950,000

* Transfusion.

appears, therefore, that though the end-results were approximately the same in the two groups, a satisfactory blood picture was recovered more rapidly when large doses of iron were administered (Table IV.).

TABLE IV.—*Effect of massive iron and other treatment on the blood picture after gastric hæmorrhage.*

—	grs. 60 Blaud's pill per diem.	Other treatment.
No. of cases	4	8
Average per cent. Hb. gain..	47	30
Average time in days ..	42	79
Average red blood cell gain	1,500,000	1,950,000
Average time in days ..	23	45

Presumably there is a deficiency of iron in the average diet given after gastric hæmorrhage and therefore delay in hæmoglobin regeneration.

Mackay has recently shown that the so-called *nutritional anæmia of infancy* is also due to deficient intake of iron and can be relieved by the administrations of iron alone. This form of anæmia is more common in artificially fed than in breast-fed infants presumably because there is less iron in cow's milk than in human milk. Infants are in part dependent upon the iron stored in the liver at birth, that taken in the milk is insufficient for growth and therefore, unless egg yolk, meat, and green vegetables are given it is important to add iron to the child's daily food. Apart from the effect on hæmoglobin production, she found that the morbidity-rate was halved in the group of infants who received iron as compared with the group who did not receive iron. She suggests, therefore, that grs. 1½ of iron ammonium citrate in chloroform water three times a day, reached by gradually increasing doses, or else a dried milk to which iron has been added, should be given as a prophylactic to artificially fed infants.

In all these iron-deficiency anæmias deficient intake of iron appears to play some part though especially in the idiopathic microcytic anæmia the body's power of absorption and distribution are also at fault. The essential in treating this group, apart from attention to general diet, is to maintain adequate iron intake. Blaud's pill administered in powdered form to ensure that the iron is readily available is the most satisfactory drug—ferrous salts being more readily utilised than the ferric salts (Witts). Ferric ammonium citrate is, however, also reliable; grs. 60 a day must be regarded as a minimum dose, while grs. 180 is well tolerated. Such large doses have been given to patients as soon as ten days after severe and repeated hæmorrhages with no complaint of discomfort and no return of bleeding. During the last few years, when these massive doses have been given, no evidence has been forthcoming to support the text-book dictum that iron produces constipation. Intravenous, intramuscular, and all proprietary preparations of iron are as useless as they are expensive.

COPPER.

The part played by copper in the treatment of hypochromic microcytic anæmias is still uncertain, but the possibility of its value should not be forgotten. A deficiency of copper will cause nutritional anæmia in the rat (Hart et al.). Mills claims that given in conjunction with iron it produces a more rapid response than iron alone. Young found that gr. ½ given daily in a pint of water relieved an anæmia that failed to respond to iron. Since only very small quantities are involved and many iron preparations contain such small amounts as an impurity it is difficult to assess the exact value of copper.

LIVER.

It is clear that liver contains two substances which effect hæmatopoiesis, since certain anæmias respond to the combination of whole liver and iron, which are uninfluenced by iron and liver extracts effective in pernicious anæmia. The anæmias responding to whole liver and iron are microcytic and have usually a low colour-index. They are anæmia associated with (1) chronic hæmorrhage (Murphy and Power), (2) starvation (Keefer and Yang), (3) deficient dietary in children (Batey), (4) past sepsis (Batey), and (5) carcinoma (Jackson and Minot).

Presumably in all these cases there is deficient intake of substances essential for normal blood production. The cachexia of new growth, for instance, is only too apt to become a vicious circle. The patient feels ill and therefore limits the diet, especially if the lesion is in the gastro-intestinal tract. Such limited diets do not contain the substances essential to blood production, and hæmatopoiesis is therefore inhibited leading to anæmia which results in further loss of appetite. Jackson and Minot believe that such cases are distinctly benefited by raw meat juice, especially liver juice, adequate iron, and vitamin-rich substances as butter and fruit. Davidson has found that iron alone will induce marked hæmoglobin regeneration in patients with malignant disease.

The anæmias which respond to liver extract, or its substitutes such as stomach preparations, can be grouped together as *megalocytic anæmias*. They have usually a high colour-index and there is an increase both in the size and the variability of the red blood-cells associated with a leucopœnia. Idiopathic or Addisonian pernicious anæmia, sprue, the pernicious anæmia of pregnancy, and pernicious anæmia

associated with gastro-intestinal lesions fall into this group (Vaughan, 1931). Though differing perhaps in their clinical features the underlying disturbance of hæmatopoiesis is dependent upon a deficiency common to them all—i.e., in the gastric digestion of protein. Our knowledge of this primary defect in gastric digestion is due to Castle and his fellow workers. Their experiments show that gastric juice normally contains some substance essential for the proper digestion of protein leading to the production of a factor necessary for hæmatopoiesis. This failure of the gastric juice occurring in the pernicious anæmia syndrome is at present unexplained. There is clinical evidence that it may be complicated as in the case of iron deficiency by failure of absorption in the gastro-intestinal canal and of distribution through abnormal blood-vessels.

There are a few patients who do not respond to extremely large doses of potent material given by mouth, but who show a prompt response when quite small doses are given either intravenously or intramuscularly. Clearly there is some failure of absorption, since apparently refractile cases respond to small amounts of potent material if given by parenteral injection (Gänssten; Strauss et al.; Wilkinson). Intramuscular preparations are without danger. Intravenous preparations may produce a lowering of blood pressure, and should therefore only be used when the patient can be under constant supervision. The possible rôle of failure of distribution due to arterio-sclerosis is evidenced by the fact that a larger proportion of patients who require a high maintenance dose have abnormal vessels than those whose maintenance dose is low.

In treating the megalocytic anæmias the first essential is correct diagnosis, the second is a realisation of the importance of adequate dosage. An anæmia with a colour-index above 0·9 should at once be suspected of falling into this group. An increase in both the size and degree of variability of the red cells clinches the diagnosis. Achlorhydria is additional evidence, but since the essential deficiency is not of acid, the presence of acid must not negative the diagnosis of pernicious anæmia. Acid is often present in sprue. It may occur in the Addisonian or idiopathic form and in other megalocytic anæmias. The presence of cord signs and a positive indirect van den Bergh reaction may be of value but are not always present.

In treating such cases it is essential to keep the red cell count well above 4,000,000 (Beebe and Lewis). The majority of cases that are reported as having failed to respond to liver by mouth have never been given adequate dosage. The group already mentioned that are unable to absorb the effective principle are small. Patients with severe cord lesions invariably require a higher maintenance dose than those without such lesions, as shown by Beebe and Lewis. In a study of maintenance dose they found a number of cases which required the equivalent of three pounds of liver a day if the red cell count were not to fall below 4,000,000. They also isolated a small group of patients who, unless iron were given in addition to liver, failed to reach a maximum figure.

Thyroid deficiency may exert a varying effect upon hæmatopoiesis. In adolescents particularly, hypothyroidism is sometimes associated with a low colour-index anæmia which is relieved by thyroid administration. There are certain cases, however, in older people, which are often diagnosed as idiopathic pernicious anæmia, some of whom respond to thyroid treatment alone, while others require both thyroid and liver therapy for complete clinical and hæmatological recovery. The possibility therefore of a mild degree of myxœdema should not be overlooked in treating apparently refractile cases of either microcytic or megalocytic anæmia (Mackenzie; Means).

Hydrochloric acid in some cases relieves indigestion, especially if whole liver is being taken. There appear to be no contra-indications to its use.

The anæmia of scurvy has been shown by Mettier and co-workers (1930) to respond to vitamin C only. Liver and iron are useless. Wills has found that some factor associated with the vitamin B complex fed in the form of marmite is as effective as liver extracts in treating tropical megalocytic anæmia. Experimental work by Guha and Mapson also suggests that vitamin B is closely associated with hæmatopoiesis. How these substances exert their action is not clear, but their possible therapeutic value should not be forgotten in treating anæmias of obscure origin.

FACTORS INHIBITING HÆMATOPOIESIS.

The factors which exert an inhibitory effect upon hæmatopoiesis either directly or indirectly are: (*a*) sepsis; and (*b*) certain toxic substances as benzol, lead, and excessive exposure to radium and X rays.

In analysing the results of liver treatment it was found that less than 1 per cent. of cases of pernicious anæmia had died since the introduction of liver, and in all severe sepsis had been present (Vaughan, 1930). Further, cases with a mild degree of sepsis require larger doses of liver or its equivalent to reach a satisfactory red cell level than patients free of infection. A guarded prognosis should be given in febrile patients, while if a satisfactory response to adequate therapy is not achieved, possible sources of sepsis should be eradicated. It is often necessary to increase the daily dose during intercurrent infections as bronchitis or tonsillitis. Sepsis exerts the same inhibitory effect on the action of iron in microcytic anæmias (Minot). How this is brought about is not known. There is a close parallel in the effect on insulin.

In treating anæmias due to toxic influences as lead or X rays, it is first of all essential to remove the patient from all further exposure. If a severe aplastic anæmia is present transfusion may be necessary. Iron, whole liver, and a balanced diet should also be given.

Blood transfusion is our only remedy in a group of anæmias of whose cause we known nothing, and for which therefore we can offer no rational therapy, neither prevention nor cure—aplastic anæmia, erythroblastic anæmia, and anæmia associated with active sepsis, nephritis, and the Banti syndrome. Forkner and Scott maintain that large doses of arsenic invariably improve the red cell count in the anæmia of chronic myeloid leukæmia. The anæmia of acholuric jaundice is relieved by splenectomy.

It appears, therefore, that apart from the latter group anæmias must be regarded as deficiency diseases which vary both in their clinical and hæmatological manifestations according as to which of the factors essential for normal blood production are lacking. The deficiency may be brought about by faulty diet, faulty digestion, absorption, or distribution, or by increased demands. Our aim in treatment must be to supply the missing factors in such a way that they can be readily utilised. Success is largely dependent upon recognition of the extreme importance of adequate dosage.

(*Bibliography at foot of opposite page.*)

THREE CASES OF ADDISON'S DISEASE

TREATED WITH AN EXTRACT OF SUPRARENAL CORTEX.

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IN March, 1930, Swingle and Pfiffner[1] described the preparation of an aqueous adrenalin-free extract of the suprarenal cortex which revives comatose adrenalectomised cats and maintains them in perfect health; cessation of treatment with the extract is followed by death of the animals within ten days. Since then, 20 cases of Addison's disease treated with this extract have been reported in America by Rowntree and his co-workers,[2] and one case in England by Levy Simpson.[3] An immediate beneficial effect followed in 18 of these cases; in the other three the treatment failed, but in two of these adequate supplies of the cortical extract were not available at the time. In three of the successful cases the patient did not receive a further course of the extract when a relapse occurred, and died after returning home. The remaining 15 have continued to improve but have all required further injections of the extract from time to time.

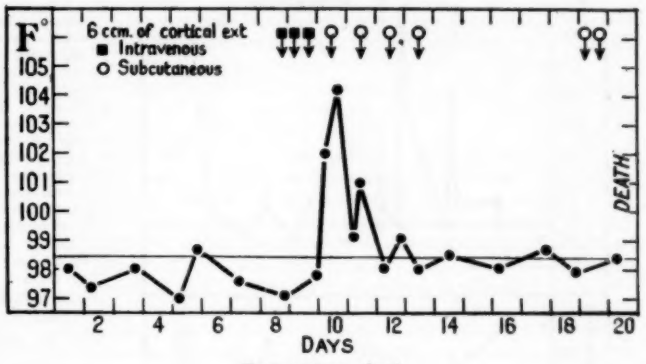
Recently a cortical extract has been prepared in England on a commercial scale by a procedure resembling that of Swingle and Pfiffner. The efficacy of this extract in the treatment of experimental animals has been demonstrated by Wilson.[4] Four cases treated with it with favourable results have been reported briefly by Levy Simpson.[5] In the cases described below, treated with the same preparation, the beneficial effects were to a great extent offset by certain toxic manifestations.

Case Reports.

CASE 1.—A woman, aged 45, admitted to University College Hospital under the Medical Unit on April 15th, 1931, complaining of indigestion for three years, weakness and vomiting for six weeks, and pigmentation of the skin for three weeks. Tuberculous arthritis of the right hip in childhood. She was very weak, but not wasted. Generalised patchy pigmentation maximal on the face and hands and in the axillæ; slight pigmentation of the buccal aspects of the cheeks. Blood pressure (syst.) 110–118 mm. Hg. No other abnormal physical signs discovered. Urine, no abnormal constituents. Blood count normal. X rays showed no disease in the lungs and no calcification in the suprarenal areas.

During the next week her condition became much worse; she could not sleep and vomited persistently, being unable to retain even small quantities of water. Acetone bodies appeared in the urine. Blood-sugar curve inconclusive owing to vomiting of some of the glucose used in the test; no glycosuria. Blood-urea 90 mg. per 100 c.cm. On April 22nd she appeared almost moribund, was extremely dehydrated and too weak to turn in bed; B.P. 102 mm. 6 c.cm. of the cortical extract and two pints of glucose saline were given by the intravenous route and continuous glucose saline per rectum. On the 23rd she was still weak and depressed. B.P. 104 mm. Two injections of 6 c.cm. each of the cortical extract given and one pint of intravenous glucose saline with 20 units of insulin to combat ketonæmia. On the 24th the temperature, hitherto normal, rose to 102° F.; pulse-rate 128. Urine contained blood, albumin, acetone, and sugar; normal amount passed. In spite of this the patient felt and looked better, taking by mouth more fluid than she vomited. B.P. 104 mm. At noon 6 c.cm. of the cortical extract was given intravenously. At 2 P.M.—temp. 104°; pulse 130. No symptoms except headache; no rigors. At 10 P.M. she had pain under the right costal margin. No abnormal physical signs found. On April 25th she passed flatus with relief of abdominal pain. At 11 A.M.—temp. 101°; pulse 132; B.P. 94 mm. Headache and discomfort in lower abdomen. Urine contained less blood, albumin, and acetone; no sugar. 6 c.cm. of the cortical extract was given subcutaneously with no subsequent rise of temperature. On the 26th the condition was very much improved. Vomited only 2 oz. in the night. Ate jelly and toast and asked if she might get up the next day. No further vomiting. Urine contained less blood, a trace of albumin, no acetone or sugar. Temp. now normal. 6 c.cm. of the cortical extract given subcutaneously, and repeated on the following day.

FIG. 1 (Case 1).



Temperature chart.

(Continued from previous page.)

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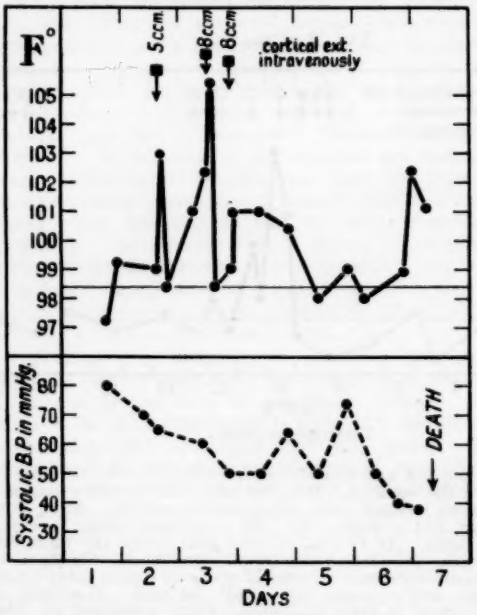
The administration of the extract was then stopped and improvement was maintained until April 30th, when intractable diarrhœa set in, following the administration of a mild purgative. Vomiting and weakness reappeared and blood, which had never totally disappeared from the urine, increased in amount. By May 4th she was again very weak and dehydrated; B.P. 78 mm. 6 c.cm. of cortical extract was given subcutaneously. At 6 P.M., another 6 c.cm. was given subcutaneously together with 1 pint of normal saline. Later she felt more comfortable and stopped vomiting. Early next morning, however, she suddenly became pulseless, with sighing respirations, and died in a few minutes.

Post mortem.—Heart: simple atrophy of myocardium. Lungs: normal; no evidence of tuberculosis. Liver: congested. Spleen: normal. Kidneys: rather congested, cortex soft and bulging; microscopically, a few fibrotic glomeruli seen, but no evidence of acute nephritis. Adrenals: twice the normal size and completely replaced by masses of firm yellow tuberculous caseation. Thyroid: normal. Pancreas: slightly atrophic; microscopically, the islets of Langerhans were normal in number; no hyaline or fibrous change. Right hip: healed scars of sinuses.

FIG. 2 (Case 3).



Temperature and blood pressure charts.

CASE 2.—A man, aged 24, first admitted under Sir Thomas Lewis on March 27th, 1931, with a history of loss of weight (20 lb.), and vague abdominal pains for two years, chronic cough for one year, and pigmentation, weakness, occasional diarrhœa, and vomiting for a few weeks. No previous illnesses. No history of tuberculosis in the family. He was somewhat apathetic and weak, and had a cough. There was moderate pigmentation of the face, hands, and of some acne scars on the back, but no buccal pigmentation. A few scattered rhonchi in the chest and slight tenderness in the left loin were the only other abnormal physical signs detected. B.P. 110/70 mm. Two sputum examinations revealed no tubercle bacilli. X rays showed slight infiltration of the apex of the left lung, but no calcification of the suprarenals. Blood count normal. Blood Wassermann negative.

As the patient's condition did not seem to require special treatment he was kept in bed and treated symptomatically. He improved rapidly and was discharged after five weeks to a convalescent home. Whilst in hospital the blood pressure readings were all above 110 mm. except for one of 96 mm. There was slight pyrexia, about 99, for the first few days; otherwise his temperature and pulse were within normal limits. On discharge his appetite was good but he had lost 4 lb. in weight.

He remained three weeks at the convalescent home, still feeling well. On returning home he rapidly became ill, with vomiting and weakness. After another week at home he was readmitted on June 16th, when his condition was found to be much worse and the pigmentation deeper. B.P. (syst.) 100–110 mm. After three weeks he was still very ill and it was decided to try treatment with the cortical extract; he was then extremely weak and apathetic, would take no solid food, and vomited once or twice a day; he slept badly and complained of abdominal pain. B.P. 76–84 mm. Blood-urea 84 mg. per 100 c.cm. Two intravenous injections of 6 c.cm. each of the cortical extract were given daily for a week, beginning on July 6th. By the third day of the course of injections he felt definitely better, his appetite began to return, vomiting had ceased, and he was sleeping well. By the end of the week he felt extremely well, had a huge appetite, was entirely free from pain, and wanted to get up. There was no appreciable rise of blood pressure and no change in the pigmentation. The injections produced no unpleasant reactions. During the week the temperature twice rose slightly (below 100°), but occasional slight pyrexia had occurred previous to the injections. Except for a trace of albumin on the sixth day the urine was normal. Blood-urea 32 mg. on discontinuing the injections. The improvement was maintained for ten weeks. He was up and about without fatigue and gained 1 st. in weight. The pigmentation was still unaltered, but the blood pressure rose during the six weeks following the course to a maximum of 108 mm. At the end of ten weeks the B.P. range was 96–100 mm., and he was then discharged feeling well.

On the same night a severe attack of asthma occurred which was relieved by adrenalin. During the next three weeks he was persistently asthmatic and vomited almost all his food. He was therefore readmitted on Oct. 20th, when the asthmatic attacks and vomiting promptly ceased. His appetite was good, but he was steadily losing weight. B.P. 90 mm. On Nov. 10th he started a week's course of four-hourly subcutaneous injections of adrenalin 1/1000. At the end of the week he felt stronger; he had gained 2½ lb. in weight, but there was no appreciable alteration in blood pressure. Improvement maintained until Nov. 25th, when vomiting returned and he had a typical attack of asthma, partially relieved by adrenalin. During that night and the next morning he had several attacks of asthma for which a total of 30 minims of adrenalin was given over a period of 13 hours; the last dose (10 minims) was given at midday. At 2.15 P.M. he felt better and drank a cup of milk. At 2.55 P.M. he died quite suddenly with no warning.

Post mortem.—Heart: small; some myocardial atrophy. Lungs: pleura adherent to chest wall; fibro-caseous masses at both apices; caseous patch in lower lobe of left lung; scanty recent miliary tubercles in upper lobes of both lungs; both lungs œdematous. Liver, kidneys, and spleen: normal. Adrenals: about one and a half times the normal size and almost completely replaced by tuberculous fibro-caseous masses; microscopically no normal adrenal tissue could be seen. Thymus: persistent, weight ½ oz.; microscopical structure typical. Pancreas: some fibrosis; islets normal.

CASE 3.—A woman, aged 43, admitted under Dr. H. Batty Shaw on Nov. 20th, 1931, with a four months' history of loss of appetite, loss of weight (21 lb.), occasional vomiting, increasing weakness, and gradual darkening of the skin. No previous history of illness. No family history of tuberculosis. Menopause at age of 35. She arrived in hospital very exhausted; temp. 97·2°; pulse soft, rate 72; B.P. 80 mm. Two days previously the B.P. was 92 mm. The whole integument was darkly pigmented, with patchy pigmentation inside the mouth. Some wasting, but not much dehydration present. Apart from the muffled character of the heart sounds physical examination revealed no abnormality in any of the systems; the urine was normal.

The next day she seemed the same, but the pulse was weaker and the B.P. 70/35 mm. Fluids were taken well by mouth. Urine excretion normal in amount. Radiograms of the chest and suprarenal areas were negative. By 3 P.M. the B.P. had fallen to 65 mm. (syst.); temp. 99°. At 3.15 P.M., 5 c.cm. of the cortical extract was injected intravenously. One hour later the patient felt cold and attacks of shivering began; temp. 103°, falling to 98·4° in two hours with cessation of shivering.

On Nov. 22nd the condition was unaltered. Temp. 102·4° at 10 A.M. B.P. 60/30 mm. At noon 8 c.cm. of the cortical extract was given intravenously. One hour afterwards attacks of shivering began; she became resentful of interference and almost unconscious at times. The temp. rose to 105·4°, falling sharply to normal within 1½ hours; the pulse-rate did not alter. That evening drowsiness and apathy continued, with occasional spasmodic twitchings of the limbs; no urine passed since 7 A.M.; pulse imperceptible; B.P. 50/30 mm. A third dose of the cortical extract (8 c.cm.) given intravenously, care being taken on this occasion to inject the warmed solution very slowly. Following this the temp. rose to 101°, but no other effects were observed. On the 23rd the patient could just be roused. Temp. 101°; radial pulse just palpable, heart-

rate 60/min., B.P. 50 mm. Blood-urea 118 mg./100 c.cm. Blood-sugar curve normal. Taking fluids well by mouth, no vomiting. Frequent spasmodic twitchings of the limbs present. Still passing no urine; only 240 c.cm. withdrawn by catheter at 1 P.M. (29 hours), containing a slight trace of albumin but no blood. Hot packs applied to the loins and diuretics administered. No more of the cortical extract given in view of the rigors. That evening she improved slightly, the pulse was stronger, rate normal; B.P. (syst.) 64 mm.

On Nov. 24th, slight twitchings were still present. B.P. 50 mm. Now passing small quantities of urine. Temp. normal. Later that day there was a definite improvement; the twitchings entirely ceased, she was less drowsy, and spoke sensibly to her relatives. Accompanying this change was a rise in blood pressure to 74 mm., an improvement in the pulse, and passage of urine in increased quantity. That night continuous rectal saline administered, of which 1¼ pints were retained. On the 25th B.P. fell to 50 mm. Incontinent of urine and fæces; very weak. 6 P.M., patient much worse; only just conscious at times, weakness extreme. Pulse often quite imperceptible, heart-rate and sounds unaltered. The temp. rose again to 102·4°; respirations rose to 44/min. and were sighing in character. B.P. 40 mm. (syst.) by palpation; no sounds audible over brachial artery. No other abnormal physical signs found. Adrenalin and strychnine given with slight temporary improvement. At midnight the pulse could just be felt; B.P. by palpation only 38 mm. Death occurred at 8 A.M. the next morning; no urine had been passed since 4 P.M. on the previous day, and none was present in the bladder just after death.

Post mortem.—Heart: small; some coronary atheroma. Lungs: small healed scars at both apices; early patchy broncho-pneumonia. Liver: early nutmeg change; microscopically fatty degeneration affecting the centre of the lobules. Spleen: normal. Kidneys: rather pale; no other abnormality either macroscopically or microscopically. Adrenals: pigmented and almost completely atrophied; microscopically, a zone of normal medullary tissue surrounded by a zone of vascular fibrous tissue containing necrosed cortical cells, aggregations of lymphocytes, histiocytes, and a few plasma cells. Thyroid: slightly atrophic. Pancreas: normal.

Since the occurrence of these cases, our attention has been drawn to some untoward effects following intravenous injection of the cortical extract in a normal subject:

A. T. W., a subject in normal health, in an experiment on the action of the cortical extract on the basal metabolic rate in man, received a single dose of 10 c.cm. intravenously. Half an hour later malaise, headache, and muscular pains in the limbs occurred. One hour after the injection shivering attacks commenced; the subject became collapsed, with clammy skin and feeble pulse of 100; B.P. 100 mm. One and a half hours after the injection his condition had improved, but shivering and pains particularly in the lumbar region were still present; temp. 103°; pulse soft, rate 107; respirations 28; B.P. 130 mm. The next morning he felt better except for headache and universal tenderness of the skin; a patchy erythema appeared all over the body and lasted 24 hours. Simultaneously herpes labialis appeared and lasted a little longer. Temp. 100·6°; B.P. 110 mm.; pulse 96. No other abnormal physical signs found. Two days later the temperature was normal and soon afterwards he returned to work. As a boy he was liable to have urticarial rashes.

Discussion.

The fatal termination of these cases of proved Addison's disease is disappointing when compared with the results of treatment obtained elsewhere, particularly as a beneficial effect followed administration of the cortical extract in Cases 1 and 2. The two factors militating against effective treatment were the disconcerting after-effects (seen in Cases 1 and 3) and lack of experience in the use of a new preparation. In Cases 1 and 2 definite improvement began after the third dose of cortical extract and was both subjective and objective. The patients rallied from their state of extreme asthenia, apathy, and depression, while vomiting ceased and appetite returned. In Case 1 the injections were combined with intravenous administration of glucose saline to combat dehydration; in Case 2 the extract was given alone. By the fifth day of the course of injections both patients wanted to get up and were eating and sleeping well. In Case 1 subcutaneous administration of the extract was substituted for intravenous after the rise of temperature and onset of hæmaturia following the third dose of extract. The relapse which occurred a few days later might, in our opinion, have been avoided had more of the extract been administered. The second case received a total of 78 c.cm. of the extract in 7 days. A few days later he was up and about the ward and began to put on weight. The average systolic blood pressure readings rose during the next six weeks by about 20 mm. of mercury. There was no appreciable alteration in the pigmentation. The improvement was maintained for ten weeks; vomiting then returned, together with attacks of asthma. On readmission to hospital, in view of the fact that vomiting had ceased, no further cortical extract was given, but the effect of a course of adrenalin was tried, which resulted in a gain in weight and strength. The occurrence of sudden death five weeks later indicates that the patient stood in need of the cortical hormone at the very beginning of the relapse. The temporary improvement following the course of adrenalin was comparable to that seen in cases treated by the Muirhead régime, which consists in administration of adrenalin to the limit of tolerance.

The severe rigors occurring in Case 3 within an hour of the injections appeared to accelerate the patient's downward progress; on the other hand, only 20 c.cm. of the extract were administered, an amount probably insufficient to produce the therapeutic effect. Suppression of urine occurred when the blood pressure was extremely low and a temporary rise of blood pressure was accompanied by passage of urine. In this connexion it may be noted that the critical level for urinary secretion is placed by physiologists between 40 mm. and 50 mm. of mercury; below 40 mm. cessation of urinary secretion invariably occurs (Starling). The infrequency of suppression of urine in Addison's disease may be accounted for by the rarity of very low levels of blood pressure. Smith[6] records a case which occurred at Guy's Hospital in 1897, before the days of the sphygmomanometer; Rowntree and Snell[7] refer to its occurrence a as terminal event. The occurrence of twitchings in Addison's disease is known but their cause is unexplained. The blood-urea in all three cases was raised; when the second case recovered from a crisis the blood-urea fell to 38 mg. per 100 c.cm. Rowntree and Snell[7] mention several cases with a raised blood-urea at a critical stage in the disease. A similar rise in blood-urea has been shown to occur with the onset of symptoms of adrenal insufficiency in adrenalectomised dogs (Rogoff and Stewart).[8]

THE TOXIC EFFECTS.

The toxic effects following the intravenous injection of the cortical extract consisted of rigors in Case 3 and in A. T. W.'s case, a high temperature and hæmaturia in Case 1, and slight albuminuria in Cases 1, 2, and 3. It is interesting to note that Cases 1 and 2 were due to tuberculosis, and Case 3 to atrophy, of the suprarenals. Similar effects do not appear to have been recorded by other workers, but in the first case of the recent series reported by Rowntree and his co-workers[3] there were some toxic symptoms which appeared one to two hours after intravenous injection of their cortical extract; these consisted of nervousness, nausea, and a feeling of coldness throughout the body. In this particular case no beneficial results following the administration of the cortical extract were observed, though a total of 500 c.cm. was given over a period of nine weeks.

In an attempt to elucidate the cause of these

phenomena certain investigations of the commercial extract were carried out. Chemical tests by Dr. F. G. Young, at University College, London, failed to reveal the presence of adrenalin, though certain phenolic decomposition products of adrenalin were present; a minute amount of chlorbutol had been added as a preservative. A small trace of protein was definitely present, not amounting, however, to more than 10 mg. per 100 c.cm. of the solution. These results, with the exception of the finding of protein, agree almost identically with those obtained from tests conducted on their own extract by Swingle and Pfiffner. The samples of extract used in Case 3 and in the case of A. T. W. were tested for chance infection on account of the occurrence of the rigors and were found to be quite sterile. A. T. W. and one control were tested carefully for skin sensitivity to the batches of extract which had produced the rigors in his case and in Case 3. The results, which were negative, cannot be considered very conclusive since A. T. W. may have been in the negative phase of sensitivity following the intravenous injection; the difficulty of obtaining positive dermal reactions at any time is moreover well-recognised.

The tests, on the whole, suggest that the cause of the toxic effects was the trace of protein present in the extract. We are informed that a modification in the method of preparation of the extract is being investigated, which it is hoped will result in the elimination of all protein. If the preparation is given in its present form, great caution in regard to administration appears to be desirable; a preliminary dose of 0·5 to 1 c.cm. should suffice to demonstrate individual susceptibility; in the absence of any rise of temperature the ordinary doses of 5 to 10 c.cm. twice daily could then be given. The intravenous route has been found the best in the American cases, and was suitable in Case 2; subcutaneous injection was not followed by any local or general reaction in Case 1 though irritating local effects are mentioned by Rowntree and his co-workers; in animals the subcutaneous route is always used and found quite adequate. It would appear that as soon as the diagnosis of Addison's disease is made, the cortical extract should be given until the symptoms, with the exception of pigmentation, have disappeared. If there is a relapse a further course of injections should be started immediately symptoms reappear; delay until the patient is in a precarious condition renders treatment with extract more unsatisfactory.

Summary.

1. Three fatal cases of Addison's disease are described.

2. An aqueous, adrenalin-free extract of the suprarenal cortex was given intravenously in all three cases resulting in definite improvement in two which was not, however, sustained permanently after cessation of the treatment: the relapses did not receive prompt and adequate treatment with the cortical extract.

3. Certain toxic effects are described in two of the cases and also in a subject in normal health.

4. As a result of chemical investigations the trace of protein present in the extract is suggested as the probable cause of these untoward effects, which resembled on the whole those seen in protein shock.

5. Certain precautions are advised in regard to dosage and administration, if the preparation is given in its present form.

In conclusion, our thanks are due to the physicians of University College Hospital who kindly permitted us to publish details of their cases; to Dr. F. G. Young, of University College, for conducting tests on the extract; and to Dr. A. T. Wilson, of the Middlesex Hospital, for permission to describe his experiences.

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THE BLOOD-SUGAR CURVE IN MENTAL CASES.

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The question of the abnormal blood-sugar curves often met with in certain types of mental patients has given rise to much discussion. One of the most recent comprehensive papers on the subject is that of McCowan and Quastel,[1] who clearly demonstrate the significance of the curve in manic-depressive insanity and define a hyperglycæmic index as a convenient measure for the degree of abnormality. The index is determined by the following formula:—

$$\frac{\text{2-hour blood-sugar level minus fasting level}}{\text{Highest blood-sugar level minus fasting level}} \times 100.$$

Before reviewing other published papers I will give the results of observations on 36 patients lately admitted to the Derby Mental Hospital. Originally 43 cases were examined, but since menstruation has been found to have a disturbing influence (McCowan and Quastel) the records of seven females menstruating at the time of the test have been omitted, all showing a hyperglycæmic index above normal. The mode of procedure in each case was as follows:—

A specimen of blood was taken in the early morning, the patient having fasted since the previous evening. Then 50 g. of glucose in 200 c.cm. of water was given by the mouth and the blood was examined at intervals of ½, 1, 2, and 3 hours. Folin and Wu's method of blood-sugar determination was used throughout. These results are recorded in the Table, together with a statement of the diagnosis, the bodily nutrition, and general remarks.

Applying the hyperglycæmic index of McCowan and Quastel to the figures obtained in this investigation it will be seen on reference to the Table that an index over 50, which, according to these observers, should indicate a severe disturbance of carbohydrate metabolism, is given by 21 patients of whom nine had definite organic disease such as hyperthyroidism, diabetes mellitus, fatty degeneration of liver, cardiovascular degeneration, or uræmia. Of these patients, 14 were definitely undernourished, a few being even markedly emaciated; three of them had organic disease, and two were melancholics, whilst the remaining nine showed no evidence of somatic disorder.

Apart from organic disease and emotional disturbance the state of nutrition of mental patients is of great importance in connexion with glucose tolerance. This is stressed because a large number of stuporose, confused, and depressed patients admitted to mental hospitals are found to be in a state of semi-starvation

due to refusal of food or to obscure toxæmia. Bang [2] found that starving rabbits exhibited a greater and more prolonged hyperglycæmia than well-nourished ones, and he concluded that in starvation the liver is not prepared for glycogen formation. That this is also the case in normal human beings is shown by Traugott,[3] who found a blood-sugar rise of 40 per cent. of the fasting level in the normally nourished person after the ingestion of 20 g. of glucose, whereas in the same person after three days' starvation an identical amount produced a rise of 243 per cent. The investigations of Staub [4] made it clear that a reduced glycogen content of the liver caused maximal blood-sugar figures after the administration of glucose, with prolonged hyperglycæmia, and he ascribes the defective glycogen formation to a transient hypofunction of the pancreas from starvation. Folin and Berglund,[5] on the other hand, from their work on glucose tolerance conclude that the glucose is disposed of by absorption by the tissues rather than by glycogen formation, and believe this to be the reason why prolonged hyperglycæmia does not occur in normal persons. The view that failure of or delayed glycogenesis in psychotics is associated with a disturbance of acid-base equilibrium has been brought forward by Mann and Scott.[6] Golla, Mann, and others [7] have recently found definite evidence that a large number of these patients show a disturbance of the $CO_2/NaHCO_3$ ratio of the blood, due probably to a failure of adjustment by the respiratory mechanism. The investigations of Eisner and Förster [8] revealed that hyperglycæmia after the

TABLE SHOWING RESULTS OF OBSERVATIONS ON THIRTY-SIX PATIENTS.

Patient.	Sex.	Age.	Blood-sugar in mg. %. Hours after glucose.					H.I.	Glycosuria.	Diagnosis.	State of nutrition.	Remarks.
			F.	½.	1.	2.	3.					
1	F.	36	81	121	164	150	158	83	Nil.	Benign stupor.	Poor.	Recovered.
2	F.	42	86	144	149	105	82	30	Nil.	Confusional insanity.	Good.	—
3	F.	21	98	142	148	90	78	0	Nil.	Puerperal toxic stupor.	Good.	Recovered.
4	F.	49	92	151	170	132	80	51	Nil.	Schizophrenia.	Fair.	—
5	F.	59	90	140	182	174	150	91	Nil.	Epilepsy.	Poor.	Resistive, tube-fed.
6	F.	54	86	153	142	108	80	32	Nil.	Alzheimer's Disease.	Good.	Cardiovasc. degen. Resistive.
7	F.	71	84	149	170	191	150	100	Nil.	Melancholia.	V. poor.	—
8	F.	30	91	138	145	158	80	100	Nil.	,,	Fair.	Recovered.
9	F.	52	90	140	165	140	78	66	Nil.	Confusional insanity.	V. poor.	Resistive, tube-fed. Recovered.
10	F.	36	90	161	182	82	91	0	Trace.	Schizophrenia.	Good.	—
11	F.	23	81	120	176	157	112	80	Nil.	,,	Fair.	Mild hyperthyroidism.
12	F.	28	110	160	155	90	100	0	Nil.	Imbecility.	Good.	—
13	F.	71	160	215	250	262	235	100	Pres.	Senile dementia.	Obese.	Diabetes mellitus.
14	F.	52	84	125	161	148	90	83	Nil.	Melancholia.	Fair.	Well-marked hyperthyroidism.
15	F.	25	92	131	151	80	90	0	Nil.	Moral delinquency.	Good.	—
16*	M.	20	138	220	360	570	380	100	Pres.	Toxic stupor.	Fair.	Died. Fatty degen. of liver, heart, kidneys.
17	M.	43	105	140	165	190	215	77	Pres.	General paralysis.	Emac.	Third stage of G.P.I.
18	F.	33	109	156	273	128	117	11	Pres.	Melancholia.	Poor.	Agitated and emotional.
19	F.	30	88	141	150	88	93	0	Nil.	Paraphrenia.	Good.	—
20	M.	22	82	129	129	126	60	93	Trace.	Schizophrenia.	Poor.	Refused food periodically.
21	F.	56	98	138	202	170	82	69	Pres.	Confusional insanity.	Poor.	Mitral stenosis. Albuminuria. Recovered.
22	M.	23	104	142	138	98	100	0	Nil.	Epilepsy.	Good.	—
23	F.	33	101	161	170	140	98	56	Nil.	Confusional insanity.	Emac.	Well-marked hyperthyroidism. Improved.
24	F.	62	105	130	165	259	235	100	Pres.	Arterio-sclerotic insanity.	,,	Marked cardiovasc. degen.
25	M.	22	96	132	146	92	101	0	Nil.	Imbecility.	Good.	—
26	F.	37	100	127	140	188	153	100	Nil.	Benign stupor.	Emac.	Resistive, refused food periodically.
27	M.	30	102	178	138	98	101	0	Nil.	Mania.	Good.	—
28	F.	45	94	232	241	169	121	51	Pres.	Confusional insanity.	Fair.	Alcoholism, jaundice, uræmia. Died.
29	F.	22	92	131	146	138	106	85	Nil.	Puerperal toxic stupor.	Poor.	Resistive. Slight albuminuria.
30	M.	35	95	165	142	90	91	0	Nil.	Schizophrenia.	Fair.	Congenital heart disease.
31	M.	25	94	158	173	72	94	0	Nil.	,,	Good.	—
32	F.	27	91	140	155	87	90	0	Nil.	Psycho-neurosis.	Good.	—
33	M.	59	104	186	286	197	132	51	Pres.	Melancholia.	Fair.	Agitated during test.
34	F.	53	98	146	169	205	115	100	Trace.	Benign stupor.	V. poor.	Resistive. Tube-fed several times.
35	F.	50	91	115	161	131	110	57	Nil.	Paraphrenia.	Poor.	Very confused and restless.
36	M.	40	98	155	172	98	78	0	Nil.	Melancholia.	Fair.	Very deluded, but not agitated.

H.I. = Hyperglycæmic index of McCowan and Quastel. F. = Fasting. V. = Very. Emac. = Emaciated.
* Curve after administration of 100 g. glucose.

administration of carbohydrates does not necessarily depend on the difference in the rate of glucose absorption and glycogen formation. These workers found a rise of blood-sugar from 85 to 110 mg. per cent. during the ingestion of white bread, and after ten minutes the value was 153 mg. Their conclusion is that the presence of carbohydrates in the stomach has a specific dynamic action on the hepatic glycogen.

Although the series of cases herein recorded is not a large one it seems reasonable to assume that in the nine emaciated patients without organic disease or emotional disturbance the low state of nutrition was the only factor which might explain the high hyperglycæmic index. This abnormal physical state can no doubt cause: (*a*) transient hypofunction of the pancreas with deficiency or absence of hepatic glycogen (Bang, Traugott, and Staub); (*b*) defective absorption of glucose by the tissues of the body (Folin and Berglund); (*c*) alteration in the pH of the blood, due to starvation acidosis and possibly to failure of adjustment of the respiratory mechanism (Golla, Mann, et al.); (*d*) abnormal lability of the hepatic glycogen so that glycogenolysis readily occurs—e.g., from introduction of carbohydrates into the stomach.

Apart from defective nutrition and organic disease one must, of course, take into account adrenalinæmia and the emotional syndrome, when dealing with blood-sugar curves in mental cases. It is an established fact that adrenalinæmia is antagonistic to glycogen formation, as is shown by the following examples:

Blood-sugar Curve after Ingestion of 50 g. Glucose.

Patient No.	Fasting.	½ hour.	1 hour.	2 hours.	3 hours.
	mg. per cent.				
2	90	140	152	108	88
35	91	115	161	131	110
Curve after Administration of Adrenalin ♏ x *Intramuscularly.*					
2	98	182	159	103	90
35	90	188	170	141	88
Curve after Simultaneous Ingestion of 50 g. Glucose and Administration of Adrenalin ♏ x *Intramuscularly.*					
2	88	250	380	330	118
35	91	240	353	265	126

It will be seen that there is almost an arithmetical summation of the effects of adrenalin and glucose in these patients. A similar mechanism, though of less intensity, is at work in the production of abnormally high and prolonged hyperglycæmia following glucose ingestion during states of emotional tension.

SUMMARY.

The interpretation of glucose-tolerance tests in mental patients is one of great complexity and in each case several factors may require to be taken into consideration. From the results above recorded it appears that undernutrition per se plays a very important part in the production of a high hyperglycæmic index and due allowance must be made for this state. Furthermore, it is well recognised that the presence of certain organic diseases, especially endocrine affections (diabetes mellitus, hyperthyroidism, &c.), hepatic and renal insufficiency, and marked cardiovascular degeneration, have to be considered, as well as the physiological disturbance of menstruation and the emotional state at the time of the test.

I am indebted to Dr. J. Bain, medical superintendent of the Derby Mental Hospital, for permission to publish the results of these investigations and to Mr. V. P. Corke for valuable help in carrying out the biochemical tests.

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VALUE OF THE KLINE TEST FOR SYPHILIS.

BY T. E. OSMOND, M.B. CAMB.,
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AND
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IN order to estimate the value of the Kline microscopic slide precipitation test for syphilis we took 2000 sera and tested them in parallel with the Wassermann [1] and Kline [2] precipitation reactions; in addition, a certain number of these sera were also submitted to the Kahn [3] and Sigma [4] reactions. In this investigation only the "diagnostic" Kline test with *heated* serum was employed, except in the first 500 cases when the "very sensitive" antigen was also used.

TABLE I.—*Comparison of Kline and Wassermann Reactions.*

Complete agreement .. 1538
Relative agreement .. 391
} 96·5 %
Disagreement .. 71 .. 3·5 %
Total .. 2000

—	Relative agreement.			Disagreement.		
	In favour of—		Undecided.	In favour of—		Undecided.
	Kline.	W.R.		Kline.	W.R.	
Early syphilis	13	0	—	5	0	—
Treated „	221	26	—	41	1	—
Not „	7	102	—	0	19*	—
—	241	128	22	46	20	5
	Total 391.			Total 71.		

* All negative W.R.'s and positive Klines.

A study of the Tables shows that the W.R. and Kline agree (more or less) in 96·5 per cent. of cases (1929), and disagree in 3·5 per cent. (71). In 46 of these 71 cases the Kline appeared to be the more correct, and in 20 the W.R. (5 being undecided); whilst among the 391 relative agreements 241 favoured the Kline, against 128 in favour of the W.R. (the remainder being undecided). It will be readily seen therefore that the Kline test is decidedly more sensitive than the Wassermann; this was particularly evident in early and in treated cases of syphilis. On the other hand, the Kline test gave 1 per cent. of "false positives" against none with the W.R. Similarly the Kline proved rather more sensitive than the Kahn, but distinctly less specific, as evidenced

by three false positives in 480 cases; a comparison with the Sigma test gave similar results.

The 2000 sera examined were taken at random and represented, for the most part, cases other than syphilis and cases of treated syphilis, together with a small number of cases of early untreated syphilis. In every case the diagnosis was very carefully established, so that an estimate of specificity as well as sensitivity could be made. In our hands the Kline test proved much more sensitive than the W.R., and rather more so than the Kahn or Sigma; in fact, it appears to be the most sensitive of all the reactions within our experience, including the Meinicke, Müller, and Hinton tests. It was more especially in early and in treated cases of syphilis that the Kline showed its superiority. On the other hand, the incidence of "false" positives (19 in 2000) was unduly high; we are quite unable to account for this, for the antigen employed was that kindly provided by Dr. Kline himself.

It appears, therefore, that the Kline test is of most value as an *eliminating* test for the exclusion of syphilis, and for test of cure rather than for diagnosis. Moreover, the test is so simply and quickly carried out (with practice 100 tests can be done in an hour) that it would be a practical proposition, where large numbers of sera have to be dealt with, to perform the Kline test on all and then retest all positives by the W.R. and/or one of the other flocculation tests.

On 500 sera the "very sensitive" Kline test was performed in addition, and it was found that this test was slightly more sensitive than the "diagnostic" and therefore preferable for eliminative purposes.

We have only a small experience of the Kline test on the cerebro-spinal fluid, but the fact that only fluids containing sugar (as proved by Benedict's test) are suitable for examination and the complicated and laborious nature of the reaction militate against it as a routine test.

TABLE II.—*Comparison of Kline and Kahn Reactions.*

Complete agreement .. 364	98·5%	Disagreement .. 7	1·5%
Relative agreement .. 109		Total .. 480	

—	In favour of—		Undecided.	Total.
	Kline.	Kahn.		
Relative agreement ..	53	38	18	109
Disagreement ..	1	2	4	7
—	54	40	22	116

TABLE III.—*Comparison of Kline and Sigma Reactions.*

Complete agreement .. 202	95%	Disagreement .. 15	5%
Relative agreement .. 105		Total .. 322	

—	In favour of—		Undecided.	Total.
	Kline.	Sigma.		
Relative agreement	57	32	16	105
Disagreement ..	12	3	0	15
—	69	35	16	120

We have to thank Colonel L. W. Harrison for permission to publish these results.

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CLINICAL AND LABORATORY NOTES

TETANUS FOLLOWING ULCERATION OF LEGS.

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AND
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ASSISTANT MEDICAL SUPERINTENDENT OF THE HOSPITAL.

A MAN, aged 61 years, of no occupation, was admitted to the Stepping Hill Hospital on August 1st, 1931, as a case of "ulcers of legs." He had extensive chronic ulceration of both legs, with parchment-like pigmented scarring surrounding the ulcers. The ulcers had been present for 12 years and were septic. He had dressed the ulcers himself with household rag and a proprietary antiseptic ointment. There had been difficulty in speaking and swallowing for four days before admission.

Examination showed tonic spasm of the jaws, but his mouth could be opened sufficiently for him to protrude his tongue. He could not swallow and articulation was difficult and indistinct. The pupils were round, regular, equal, and reacted to light and accommodation. The knee-jerks could not be elicited. The urine was normal. On August 2nd his condition was the same, except that the mouth could scarcely be opened. On the 3rd the neck muscles were rigid and there was some rigidity of the abdominal muscles. On the 4th there was definite opisthotonos, and in the early morning of the 5th he died. The case was apyrexial throughout and he remained conscious until death.

The blood-urea was 47 mg. per 100 c.cm. The blood Wassermann was strongly positive 1/45 dilution.

Treatment was instituted on August 2nd by the administration of tetanus antitoxin intrathecally and intravenously in doses of 10,000 units under a general anæsthetic. Glucose salines were given per rectum and chloral and bromide added to the salines. Post-mortem examination on August 6th was negative except for fatty degeneration of the liver, possibly due to the long-continued septic condition of the legs. Pus from the surface of the ulcers on both legs was sent for pathological examination and the report was as follows:—

Bacteriological examination.—A stained film of the pus from the ulcer showed a few bacilli with round terminal spores, numerous streptococci and staphylococci. Tubes of cooked meat medium were inoculated with the pus and incubated anaerobically; in 48 hours the medium was turbid, with gas present, and some blackening of the meat had occurred; a film showed numerous round terminal-spored bacilli and streptococci. The culture was heated to 75° C. for 30 minutes to destroy non-sporing bacilli and a loopful inoculated into the condensation water of an agar slope as recommended by P. Fildes.[1] After 24 hours anaerobic incubation there was a fine growth over the whole surface of the slope and a feathery edge at the top. From this edge a subculture was made to another agar slope in order to be sure that the culture was pure, although a film showed only bacilli resembling *B. tetani*.

A suspension of the growth from the top of the second slope was made with saline, and 0·5 c.cm. was inoculated subcutaneously into the hind limb of a guinea-pig, a similar dose being given to a second animal which was protected

[1] Brit. Jour. Exper. Path., 1925, vi., 62.

one hour previously with 2000 units of tetanus antitoxin. In 18 hours the inoculated limb of the unprotected subject was extended, the muscles being in a tonic unrelaxing spasm; later in the day the other leg became involved but the spasm was not continuous. In 36 hours both legs were fully extended, the animal lay on its side, and when the cage door was opened a general spasm occurred, the head being drawn back; these general spasms became frequent and the animal died in 48 hours.

Post mortem there was hæmorrhagic œdema at the site of inoculation extending up to the lower abdominal wall. Loopfuls of this fluid were inoculated into cooked meat and agar slopes and after 48 hours' incubation characteristic bacilli were seen in films from both the cultures. A culture of the blood was sterile.

The protected guinea-pig remained well for three weeks, when it was killed. Apart from some swelling of the limb where the culture was inoculated there was nothing abnormal post mortem.

Tetanus is a rare complication of chronic ulceration of the legs. In this case there was no traumatic history, nor evidence of wound contamination with soil. An identical case has been recorded by Dr. W. S. Brindle.[2]

We have to thank Dr. Lois Stent, of the Public Health Laboratory, Manchester, for the bacteriological investigation and report.

RUPTURED TUBAL GESTATION.

BRUISING IN THE UMBILICUS AND ON THE ABDOMINAL WALL.

By W. E. Tanner, M.S. Lond., F.R.C.S. Eng.,
SURGEON TO THE PRINCE OF WALES'S HOSPITAL, TOTTENHAM.

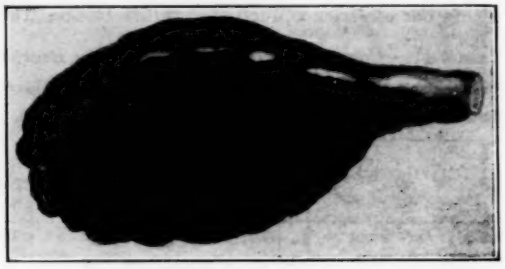
A woman, aged 30, married five years but without children, was seen on Oct. 31st, 1931. She said she had had no previous illnesses and until the present illness the menstrual history was normal. The last period was on Sept. 24th. On Oct. 17th, as she was cooking the dinner, she suddenly felt severe pain in the vulva and a desire to pass water. The pain spread to the abdomen below the umbilicus and caused her to break into a sweat and feel faint. Soon she had an attack of severe vomiting. The pain and sickness continued; on Oct. 20th she noticed discoloration in the navel and on the following day this spread to the lower abdomen. She was seen by her doctor, who thought she had been kicked in the abdomen, and although she did not go to bed she was fairly comfortable. On the 30th she was again seized with severe pain in the vulva and abdomen accompanied by vomiting and faintness. She called in her doctor, who admitted her to a nursing home. The pains in the abdomen recurred at intervals of about 15 minutes. When seen on the 31st she said that her last period was one week late but she had had a thin pink discharge from the vagina on that morning.

Fig. 1.

Showing "bruising" of the umbilicus and lower abdominal wall.

Examination.—She did not look anæmic. The pulse was 72 and the temperature normal. The abdomen was discoloured (Fig. 1). The bruising was just beneath the skin and the bright discoloration of the umbilicus showed that that was the part first affected. The lower abdomen was distended, slightly rigid, and tender, and there was movable dullness in both flanks. Nothing unusual was felt on rectal examination. A diagnosis of ruptured ectopic gestation was made and an operation advised.

Fig. 2.



The tube removed. (Natural size.)

Operation.—Median laparotomy below the umbilicus. There was no discoloration outside the peritoneum, but on opening the peritoneum the cavity was found to be full of blood. The right Fallopian tube was dilated at its outer end and surrounded by loose blood clot, but was lying free in the pelvis and not attached to any other structure. The outer part of the right tube was removed (Fig. 2) but the right ovary was left. The abdomen was closed without drainage. She made a good recovery.

The bruising was not the result of a retroperitoneal extravasation of blood from the pregnancy becoming attached to the parietal peritoneum. It must have come through the lymphatics at the umbilicus direct from the peritoneum into the skin and subcutis. I cannot find a record of any similar case.

[2] Brit. Med. Jour., 1931, i., 396.

A CASE OF ACUTE CHOLECYSTITIS.

By J. H. Peel, M.R.C.S. Eng.,
RESIDENT MEDICAL OFFICER, HILLINGDON COUNTY HOSPITAL, MIDDLESEX.

A woman, aged 62, was admitted to Hillingdon County Hospital complaining of abdominal pain and vomiting. She was found to have a large ulcerating carcinoma of the left breast, and the history of the carcinoma dated back for five years. She had had two operations, and had recently been treated by deep X ray therapy, which had failed to check the advance of the carcinoma.

On examination of the abdomen, a lump the size of a lemon was felt in the right iliac fossa. It was tender, tense, and cystic; it was dull on percussion, and there appeared to be an area of resonance between the lump and the liver dullness. The lump was fixed. The rest of the abdomen moved on aspiration. The patient did not appear to be very ill, and was not in

any pain, except on palpation of the lump. The temperature was raised to 101° F. in the evening; the pulse-rate was 110, and the respirations 24. There was no history of jaundice nor of kidney trouble. The urine was normal, and the bowels quite regular. The patient had vomited twice on the day before admission.

The diagnosis of secondaries in the peritoneum or the right ovary (breaking down) suggested itself, or possibly an appendix abscess. A laparotomy was performed, and the lump was found to be an enlarged and acutely inflamed gall-bladder. On palpating the neck of the gall-bladder a stone was felt in the position of the cystic duct. Cholecystectomy was performed. No stones were felt in the common bile-duct. On opening the gall-bladder after operation a single non-faceted cholesterol stone was found and the fluid distending the gall-bladder was faintly bile-stained mucus. There was no evidence of secondary deposits in the liver, peritoneum, or the uterine adnexa. The patient made an uneventful recovery from the operation.

SOME USES OF FARADISM IN TREATMENT AND DIAGNOSIS.

By H. W. Hales, M.D. Camb.

A woman, aged 42, sustained a motor accident which resulted in shock and pain in her back, sufficiently severe to keep her awake all night and produced by the slightest movement. A radiogram revealed a fracture of the right transverse process of the second lumbar vertebra. She always sat hunched up with her shoulders forward, supporting the weight of her body on the outstretched palms of her hands. There was a good deal of bruising over the left gluteal region, but no particular tenderness was noted here and radiography failed to reveal a fracture.

Diathermy and anodal galvanism to the lumbar region and coccyx did little to relieve her pain. I therefore tested the whole of the region between the first lumbar vertebra and the coccyx, extending four inches on either side, by the subfaradic test for cutaneous hyperæsthesia, according to the method of C. B. Heald.

In this test an indifferent electrode of moderate size is placed under the hand or at some point remote from the area to be tested; the other terminal is connected to a pointed electrode about one-sixteenth of an inch across. The current is so regulated that it is just imperceptible to sensation over a neighbouring area of normal skin. The electrode is then moved over the area to be tested. If the current becomes perceptible, the area where this occurs is charted and compared with the opposite side. Alternatively, a current which is just perceptible and quite painless over normal skin may be employed, and any definite increase in intensity or sign of pain noted as above. The alteration of the vibrating sensation of faradism to that of pricking or burning is a very definite sign and was originally described by Head in his classical paper. I have never found it present in a normal nerve.

The test showed a somewhat indefinite positive reaction for the spinal nerve immediately adjacent to the site of fracture. It was very positive, however, for the left posterior primary cutaneous branches of the first, second, and third sacral nerves. On testing this area, a particularly sensitive spot was found corresponding to the second sacral nerve. This spot was marked by a skin pencil. All four coils of the coil were put in the circuit, and the soft iron core withdrawn. The core was then suddenly inserted completely for a moment, with the pointed electrode over the marked spot. There was immediate relief, and apparently a complete cure of her symptoms in this region has resulted. As might be expected, the lumbar region of her back was still somewhat painful.

I have used the clinical application of this test for several years for the treatment of headache and allied conditions. A hypersensitive nerve, often the supra-orbital, is isolated with the usual small current, and then a strong current is applied for a moment. The results are often dramatic, and have usually been lasting. It has been employed in over forty cases, including neuralgia of several weeks' duration and severe influenzal headaches. The treatment is almost painless, and the percentage of successes is high.

Two theories suggest themselves as possible explanations of this phenomenon. The nerve sheath may be involved in minute external adhesions following hæmatoma or injury, and the sudden current may cause a contraction which breaks these. The nerve impulse is in the nature of an alternating current of 500 cycles, each of which consists of 10,000 high-frequency oscillations.[1] It is possible that the frequency in the painful nerve becomes slightly altered from that present elsewhere and thus causes pain. (Compare the hum present when an A.C. dynamo gets out of tune with the rest.) Possibly the faradic current overwhelms this non-synchronising current and then, when it has ceased, the normal condition of synchronisation is restored.

This method can be compared with galvano-acupuncture, and several patients have been relieved by the latter where the former has failed. I think that the method described is only effective for treatment where the nerve sheath is intact. The pain, which is relieved by galvano-acupuncture, is due to currents escaping from a nerve which is uninsulated owing to its destruction of its sheath as a result of injury.

The subfaradic test is of value in detecting cases of malingering. If the patient is prevented from seeing the test and the same spot is accurately localised on several different occasions, there can be little doubt that a pain is genuine. If, however, there is a wide divergence in the site of pain at each test, and there is reason to suspect malingering, doubt will be very much intensified by this method.

NEW INVENTIONS

A NEW HIP SPLINT.

This splint is intended for temporary use in motor accidents, and for moving patients by road. As will be seen from the illustration it is based in all particulars upon the principles of a Thomas hip splint

and packs flat for use in an ambulance. It has a swivel joint on either bar below the buttock half circle. This allows for the splint being used for the right or left lower extremity as required. The anterior half circle being removed allows of application with ease and without pain.

Messrs. Down Bros., St. Thomas's-street, London, S.E., have made the splint from my design.

H. E. Rawlence, M.D., F.R.C.S.Edin.

[1] As E. D. Adrian suggested in his Oliver Sharpey lectures in 1925, The Lancet, 1925, i., 1229.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

Dr. J. GORDON THOMSON, the President, took the chair at a meeting of this section on Jan. 7th, and Prof. W. SCHULEMANN, of Elberfeld, read a paper on

Synthetic Antimalarial Preparations.

He began by surveying the history of the use of quinine and of research into the nature of the malaria parasite and the rôle of the mosquito. Roehl's technique of experiments on canaries had made it possible to assess many groups of drugs in the laboratory, and the treatment of general paralytics with malaria, inoculated through the mosquito, provided a means of carrying out clinical tests of drugs on the human subject in northern climates. Quinine consisted of a quinoline ring bound to a basic heterocyclic group. An extensive search for other combinations effective in malaria had shown that the only ones with any definite action were methylene-blue and salvarsan. Investigators had prepared an extensive series of synthetic products with a constitution similar to that of quinine. It had been generally assumed that an antimalarial drug must contain a quinoline nucleus, with an aliphatic basic group bound by a carbon bond to the fourth position of quinoline. These researches had been unsuccessful. Prof. Schulemann and his colleagues had based their experiments on methylene-blue, substituting in one of its aromatic amino-groups an aliphatic basic group in place of an alkyl radical. Roehl had found this compound to be effective in bird malaria, but it had the definite characteristics of a dye. They had therefore transferred their experience to the quinoline group, uniting the basic aliphatic radical to the quinoline nucleus by a nitrogen bond. The first compound which they had prepared (amino-quinoline) had had a marked therapeutic action on proteosoma infection in canaries. Proceeding from this starting-point, and with full collaboration with physicians, the workers had produced a large variety of substances by changing the various components of amino-quinoline in different ways.

Roehl had tested all these compounds in animal experiments, and plasmoquine had been selected for practical clinical investigation. Prof. Schulemann demonstrated the formulæ of quinine and of plasmoquine side by side on the same chart. The gross formulæ and the molecular weights differed very little. Sioli, he said, had found plasmoquine therapeutically effective in malaria artificially inoculated for general paralysis, and Roehl had shown its action in natural human malaria; the latter worker had also discovered that it destroyed the gametocytes of *Plasmodium falciparum*, a property which quinine did not possess. This surprising result showed that plasmoquine was not a substitute for quinine, but had different therapeutic properties.

The three types of plasmodium, it was known, reacted to drugs in a different way, and it was also probable that the parasites reacted in different ways at various stages of their development. Work in British India had shown that with plasmoquine, alone or combined with quinine, it was possible to reduce the relapse rate of tertian malaria from 50 per cent. (the usual rate with quinine) to 2–5 per cent. In subtertian malaria the results were not quite so satisfactory, but in this variety only was it possible to assess the value of plasmoquine at all accurately. Its action on the gametocytes of tertian malaria was not definitely known, and all that should be asserted was that it acted on the schizonts as well as on the gametocytes of *P. vivax*.

Quinine acted effectively on the schizonts of *P. falciparum* and allayed the acute clinical symptoms, but it could not inhibit the development of gametocytes and even appeared to stimulate it. Plasmoquine, while it had practically no effect on the schizonts, destroyed the gametocytes in a few days, but it did not inhibit their formation. Minimal doses which were too small to destroy the gametocytes nevertheless prevented them from infecting the anopheles. Here, for the first time, it appeared possible to break the cycle man-mosquito-man, and work along these lines was being performed in West Africa, but plasmoquine had in no way superseded the usual sanitation methods.

Prof. Schulemann exhibited a diagram representing the development of the malaria parasite. In subtertian malaria, he said, quinine broke the cycle at the stage of schizogony, while plasmoquine broke it at the stage of gametocyte formation. However, it was not known which phase gave rise to relapses and what drug affected that phase; nor was it known what drug affected the development of the sporozoite into a ring form. Warrington Yorke and Macfie had shown that quinine had no causal prophylactic action in malaria, but James had shown that plasmoquine had that action. This work was the starting-point of important future research. It ought to be possible to discover new drugs which might attack the cycle at other points. The lecturer mentioned recent work along these lines.

Mietzsch and Mauss at Elberfeld had formulated another heterocyclic ring system and the resulting compounds had been tested by Kikuth. The new product differed in its action from plasmoquine and would probably be effective against the schizonts though not against the gametocytes. It seemed to have advantages in dosage and duration of treatment, and to reduce the number of relapses. It was known provisionally as "erion," but this name was not to be used in future.

Prof. Schulemann concluded by emphasising the importance of collaboration with other investigators, and paid a tribute to the help he had received from workers in the British Empire.

DISCUSSION.

Sir HENRY DALE pointed out that work of this kind did not follow logical sequence, although the subsequent account of it might be logically expressed; its success was largely due to careful and patient research on the lines of trial and error.

Lieut.-Colonel S. P. JAMES remarked that the observation of the action of plasmoquine on the parasite in its different stages had led to important changes in current ideas and aims in the chemotherapy of malaria. Whereas, formerly, it had been generally believed that the problem was the single one of finding a drug which would act more effectively than quinine in malarial attacks, the problem was now realised to be fourfold. Plasmoquine was the

only drug known at present to destroy the sporozoites, but even it would not give complete protection under exacting conditions. Quinine was effective against the asexual parasites. On the sexual forms plasmoquine acted excellently, in smaller doses than against the sporozoites. The speaker doubted whether plasmoquine really reduced the relapse rate; in malignant tertian malaria it was no more effective in this respect than quinine. This had been shown by five cases at Horton. One of the difficulties in appraising a drug was the existence, in each species of parasite, of various strains, differing in virulence. Quinine had proved effective against *P. falciparum* infection from India and West Africa, but not against strains from Rome and Sardinia. It was important to know whether the good results obtained with the new drug could have been obtained with quinine. For the chemoprophylaxis of malaria a drug was needed with the same action as plasmoquine, but less toxicity; for chemotherapy one was needed which, given in moderate doses for a short period, would not only cure the attack, but prevent relapses.

Prof. WARRINGTON YORKE wondered whether it was really true that inoculated sporozoites immediately entered the red corpuscle. He thought it possible that in ordinary malignant tertian malaria the rings multiplied in the red cell. Before plasmoquine had been introduced, gametocytic crescents had been known to disappear from the blood under a heavy dose of quinine, and possibly they did not live very long in any case. If any real advance in chemotherapy were to be made, the biological side must not be burked. Quinine was a unique and remarkable drug, and it was not creditable that so little was know about its action.

Prof. ROBINSON described his investigations of substances of the plasmoquine type. He was, he said, experimenting on derivatives with a short carbon chain, with one alkyl group at the end. Whenever he departed from Prof. Schulemann's work, the activity seemed to disappear.

Sir MALCOLM WATSON said that the gamete did not come off where Prof. Schulemann had shown it. He would himself have more faith in a drug that destroyed the schizont than in one which only acted upon the gamete. He hoped to try plasmoquine on the population of a large copper mine near the Congo border, where accurate observation was possible. Malaria in a cold climate was not always the same thing as in the tropics.

Dr. P. H. MANSON-BAHR stated that patients with benign tertian malaria had been particularly grateful for plasmoquine. Clinically and experimentally, plasmoquine was specific for *P. vivax*; it had less action on the quartan and still less on the merozoites of the subtertian forms. Its most remarkable action was upon the gametocytes, especially in combination with quinine. It had no bitter taste, and did not readily provoke toxic symptoms in children; it was especially useful for pregnant women, for it was harmless and tended to prevent relapse; and it was valuable in the convalescent stages of blackwater. Possibly plasmoquine acted as a chemical alterative of quinine, enhancing its value. An idiosyncrasy undoubtedly existed, and plasmoquine cyanosis appeared, especially in recent victims of malaria who had basophilic degeneration of the blood corpuscles, but it was not a very dangerous condition. It was undesirable that patients should dose themselves, but this possibility afforded no reason for condemning the drug out of hand. The prejudice against it in West Africa probably existed because over 90 per cent. of the malaria in that country was subtertian.

Dr. M. A. ARAFA described the results of plasmoquine treatment on over 100 patients in Cairo. Combined with quinine it caused no toxic symptoms and cured the intestinal and hepatic disorders associated with malaria. The results of the intravenous injection of plasmoquine compound were not better than those of oral administration, and the blood pressure tended to fall. The most convenient dose was 0·04 g. plasmoquine and 1·2 g. quinine daily for one week, followed by four days' rest and three days' treatment alternately for the next five weeks. This combined interrupted treatment sufficed to clear the blood of both rings and crescents in an average of four days and without toxic symptoms. Only three relapses had occurred.

REPLY.

Prof. SCHULEMANN, in reply, emphasised the necessity for distinguishing carefully between tertian and subtertian malaria. In the subtertian form plasmoquine ensured that the gametocytes should be rendered ineffective in a day or two. It was necessary to exercise great caution in administering new preparations, because substances with short side-chains had been known to cause disorders of the central nervous system which were not apparent in experimental animals. It was neither necessary nor desirable to give pure plasmoquine intravenously, for it was not effective in coma, the only condition in which intravenous injection was requisite, and it acted upon the bundle of His to cause heart-block.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.

AT a meeting of this association, held at University College, London, on Jan. 8th, with Dr. G. E. FRIEND, the President, in the chair, a discussion took place on

Physical Education in Schools.

Mr. T. N. MORTIMER BOOTH (physical instructor, Christ's Hospital) said that the admitted lack of any uniform system in schools might be largely due to the difference in the type of personnel responsible for the methods adopted, and to the lack of the complete training of the teacher The relation of the physical to the mental development of the boy should always be kept in mind; then a due relation would be observed to the other subjects in the curriculum. It was not now believed that the ordinary games of school life sufficed for every type of boy, there should be close inspection and control by the competent physiologist. No system could well be applied to all types of school, and the numbers of pupils to be dealt with entered into the question very importantly. Also there still existed the old conflict between the methods evolved by the Army school and by the Board of Education. It was wrong, in the speaker's view, to regard the Army instructor as too limited in outlook, to consider that his exercises were fit for adults only, and that his drill did not make for mental alertness. So-called "drill" Mr. Booth did not consider soul-destroying if it was done in the right way. It should not be thought enough to lump all boys together because they were of the same age, for all sorts of problems were presented by the individual. In the experience of all instructors

there were boys who hibernated during school hours and only emerged from their torpor as meal-time approached. None but the fully trained could be regarded as suitable for school instruction, and of these the supply must necessarily be limited. It was recently declared that it required three years to turn out a fully competent woman instructor; also that the physical education of our sons was half a century behind that of our daughters. The director of physical education should see each boy with his form daily, but the difficulties in the way were immense. In a large school there might be 20 or more forms, and the later hours of the day were not suitable for the purpose. Perhaps more time would be assigned by headmasters for physical education when a boy was allotted so many marks in his school certificate for his chest expansion. How should the results of physical education be tested, and by whom should the testing be done? On one hand it was suggested that the physical training expert should have the matter largely in his own hands, and that he should even be expected to advise the headmaster on questions of food and clothing, the medical officer being very much in the background in this respect, as he was associated in the mind of the boy with the stethoscope and disease. The practical experience at Christ's Hospital, however, went to prove the reverse of this—namely, that the medical officer should be in the foreground and be associated with physical fitness. The study of biology should greatly facilitate a greater interest being taken by the boy in the function and condition of his own body. At Christ's Hospital Dr. Friend saw every boy, apart from cases of sickness, three times every term for purposes of measurement; and the records constituted valuable data, which were subsequently available for both the medical officer and the instructor. Apart from the preparatory school, there were 700 boys, aged from 10 upwards, and besides leading a full and active life out of school at the games in season, they took part in such domestic routine as cleaning their shoes, making their own beds, and serving at table, so that little time was available for organised physical training in out-of-school periods. In this school a compromise in the way of exercise in proper costume between 10.30 and 11.5 A.M. each morning had worked happily for years, and resulted in the second part of the morning's studies being attacked with enhanced zest.

DISCUSSION.

The PRESIDENT showed a series of graphs illustrating seasonal variations in weight and measurement of the boys at Christ's Hospital, and including the results of the war rationing.

Dr. MURRAY LEVICK said that the London University advisory committee on this subject (of which he was a member) had fully considered the fact that physical fitness of school boys and girls depended not on exercises alone, but on the four factors: exercises, diet, atmospheric hygiene, and a properly arranged time-table. Juvenile health had reference to many subjects with which the schoolmaster could not be expected to be expertly conversant, therefore the hygiene of a school should be supervised by a specialist. At many schools the meals served were sadly lacking in vitamins. The breakfast at one large public school, for instance, consisted of white bread and butter, tea, kippers, marmalade, or jam. At another the only meal between midday and breakfast the next morning consisted of white bread and butter and one of the three following: potted meat, cake, sardines. The director of physical education in a school should be able to coöperate with the medical officer in the supervision of the school dietary and the ventilation of the school rooms and dormitories. Girls' schools were far ahead of boys' schools in the matter of physical education; and he advocated starting a three months' course in physical education for masters in charge of games at boys' schools. He also thought general practitioners, fulfilling the post of medical officer at a school, should pay regular visits to the school and supervise the choice and serving of the foods.

Major GARNIER (superintendent of the Lucas Tooth Physical Training Institute, Bermondsey) described his methods. He found it essential, he said, to have an attractive programme, otherwise the youth it was his special aim to secure would not continue to attend. His view was that three years' training was needed to make an efficient whole-time instructor. His pupils ranged in age from 14 to 44, and he had now 250.

Mr. F. CAHILL pleaded for an immediate practical outcome of this meeting. He was disappointed with the way in which the Board of Education had attempted to deal with this question.

Mr. R. E. ROPER exhibited some graphs with the object of showing that there might be a causal relation between a low or inadequate dietary and the onset of a definite cerebral disturbance. One showed that a period of concentracted cramming for examinations coincided with reduced measurements and poor appetite. In another, a boy committed thefts and other misdemeanours when his weight was at its lowest.

Dr. G. P. CROWDEN considered that the first care of the school doctor should be devoted to diet; it must not be assumed that the nutrition of the school boy would look after itself. Training should be placed next. The efficiency of the school medical officer was not to be judged by the extent of his practice; his work in the school life was preventive. Unless he knew what was necessary in this way he would not be able to control the conditions which would lead to the maintenance of the boy's health and proper fitness. He agreed with Mr. Booth's suggestion that marks should be given in the boy's certificate for physique, as that would greatly encourage him to take an interest in his physical condition. Three bodies which had greatly interested themselves in this question were the British College of Physical Training, the Gymnastic Teachers' Institute, and the National Society of Physical Education. These had now amalgamated to form the British Association for Physical Training. He preferred the term "physical education," for that implied a study of school hygiene, physiology, and anatomy. Over a thousand school teachers had taken the association's certificates. Leeds had taken the first organised step to provide training for those who wished to become physical instructors, for both elementary and public schools, and he hoped that the London County Council, or London University, would see its way to take up this subject and raise it to University status.

Dr. L. R. LEMPRIÉRE said he had been medical officer of Haileybury College for 22 years, and had control of the physical training at it. It had been of great advantage to him, for it enabled him to know the boys, and to study them when they were on the move, in a way that would not have been possible otherwise. Two types of physical training were at present carried

out in schools. One was the free-standing exercise done by the entire school probably once a day, and controlled largely by the senior boys, who had been taught their part. The other kind consisted of free-standing work plus apparatus work, carried out by only part of the school and for a short time, and supervised and directed by trained instructors. In a general way, ground work alone was not sufficient; and he questioned whether the senior boy could be capable of instructing adequately. The boys who most needed physical training were those of subnormal physique under 16 years of age. Certainly the best results he had seen came from a combination of the two systems. A good stance, alertness, and rapid response to command he regarded as very important.

Mr. BROCHS spoke from a particular experience of secondary schools, and highly recommended a book on the subject which had been issued by the Board of Education. Just before and during examination time there was a strong tendency to allow exercises to be neglected, yet that was the time when they were most beneficial.

The PRESIDENT said the control of physical training in schools could not be the sole matter of the medical officer, nor even of the director of physical education in the school; it depended on a correlation of the interests and the activities of the whole of the school life.

PATHOLOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

A MEETING was held at Guy's Hospital on Jan. 8th and 9th, Prof. R. DONALDSON being in the chair.

R. A. Q. O'MEARA (Dublin) discussed the biochemical mechanism of the formation of acetylmethylcarbinol, which is of interest to bacteriologists because it is the basis of the Voges-Proskauer reaction.—S. J. HARTFALL and L. J. WITTS (London) described their extensive observations on persons with achlorhydria who may have normal blood or may suffer from secondary microcytic or macrocytic Addisonian anæmia. Their gastric juice obtained with histamine will act on minced beef with the production of Castle's factor which is effective in curing pernicious anæmia.—C. J. POLSON (Leeds) described three cranial tumours which produced the chiasmal syndrome by involving the optic tracts: a pinealoma, a carcinoma of the ethmoid, and a tumour of Rathke's pouch.—J. DAVIDSON (Edinburgh) in a long series of cases of fatal eclampsia found the liver necrosis variously situated in the periphery or centre of the lobules. The kidneys relatively rarely showed tubular degeneration and hæmorrhagic lesions were uncommon in both organs.—J. W. ORR (London) described the reaction of the lymphocytes and histiocytes of the rat's spleen to infection with streptococci.—A. E. BOYCOTT and C. L. OAKLEY (London) gave an account of the extensive pleural effusions which are the cause of death in rats living in air containing 95 per cent. of oxygen, and of their failure to make rats anæmic by keeping them for many weeks in 50–60 per cent. oxygen.—J. H. DIBLE (Liverpool) by chemical analysis found a good deal more fat in the parts of human hearts showing histological fatty degeneration than in the neighbouring normal muscle.—G. R. CAMERON (London) described how earthworms react to foreign bodies by phagocytosis by the cœlomic cells, by expulsion through the dorsal pores, by extrusion through the nephridia, and by getting rid of the affected parts altogether by autotomy.—C. E. JENKINS (Salford) had deduced a formula for calculating the volume of a red corpuscle which he made to be about 82 cubic micromillimeters. He also described an ingenious method for ascertaining the relative volume of red cells in blood by measuring the relative volume of plasma by adding laked blood. The method gave results about 10 per cent. lower than those given by the hæmatocrit.—W. M. CROFTON (Dublin) showed lantern slides of microbes which he had isolated from sarcomata and claimed to have produced sarcomata in rats with them; J. A. MURRAY had seen the lesions and thought they were abscesses.—HELEN CHAMBERS and GLADWYS M. SCOTT (London) showed that emulsions of rat sarcoma developed some substance after standing a short time which on inoculation into rats rendered them refractory to tumour implantation. No protective effect had been obtained with any preparation which was certainly free from cells, though it was not clear that cells as such were responsible.

T. LUMSDEN (London) continuing his observations with the euglobulin fraction of an anti-human-cancer sheep serum containing the anti-malignant bodies, found that the serum caused necrosis of spontaneous mouse tumours when it was injected into them, and that this so immunised the animals that autoplastic transplantations made a few days later nearly always failed.—C. H. ANDREWES (London) showed that several different fowl sarcomata could be transplanted successfully into pheasants though they could not be carried on in these birds.—S. P. BEDSON (London) gave a number of reasons for thinking that the elementary bodies in psittacosis were indeed the causative virus of the disease, and J. C. G. LEDINGHAM (London) gave a convincing demonstration that during an attack of vaccinia a rabbit develops agglutinins for the corresponding vaccinial bodies which increase and decline in the same sort of curve as is familiar in the antibody reaction to bacteria.—W. J. ELFORD and C. H. ANDREWES (London) showed that each sort of bacteriophage had a characteristic size varying in different kinds from about 8 to about 75 micromillimetres.—R. W. FAIRBROTHER (Manchester) had found that mixtures of vaccinia virus and antiserum which were neutral by the skin test would kill rabbits on intracerebral inoculation.—A. T. GLENNY and MOLLY BARR (London) showed, in a series of elegant experiments, that mixtures of diphtheria toxin with some preparations of antitoxin might dissociate so much after inoculation as to kill the test animal whose blood might contain enough free toxin to kill a second animal in quite small doses. They pointed out the consequent danger of toxin-antitoxin mixtures prepared for immunisation and said that it was difficult to devise a perfectly satisfactory animal test of their safety for human use; P. HARTLEY agreed with this, and urged that for this purpose toxin should always be replaced by toxoid.—A. FEIIX (London) discussed the factors which determine the type of antibacterial antibodies found in normal animals.—H. J. PARISH (London) pointed out that cultures of the meningococcus and other delicate bacteria could be satisfactorily preserved alive for a long time by covering them with liquid paraffin.—J. G. THOMSON (London) gave an interesting account of the occurrence of the protozoon *Glugea anomala* in sticklebacks near London.—MARY M. STEWART (Aberdeen) described the bacterial flora of the skin and alimentary canal of the haddock.

(Continued at foot of next page.)

REVIEWS AND NOTICES OF BOOKS

Radiologische Praktika.

Band XVIII. *Einfuhrung in Die Röntgen-Therapie Erkrankungen.* By Priv.-Doz. Dr. J. PALUGYAY. Leipzig: Georg Thieme. 1931. Pp. 103. M.10.

THIS is in many respects a valuable monograph on the X ray treatment of surgical diseases: it is a short survey of the present position in the application of X rays to the various conditions covered by the title, and is intended to serve as an introduction to the study of more elaborate treatises, to the position of which it makes no pretence. General biological and technical details are omitted, but fairly close accounts of the techniques used by the author or to be found in medical literature are given. Throughout, the doses are stated in international *r*, and it is pleasant to see that the author has freed himself sufficiently from the shackles of the unit skin dose, not only to employ the *r*, but also to give the doses which should be received at the lesion below the surface, and not merely the dose on the surface.

The two sections of the book which will probably be of greatest general interest are those devoted to the treatment of surgical tuberculosis and malignant disease respectively. With respect to the former, the author advocates homogeneous irradiation, for instance, of the joint, with very small doses of penetrating radiation, even though the lesion might be thought to be accessible to larger doses of softer rays. It is maintained that it is "better to give much too little than a little too much" in the treatment of tuberculous lesions, doses of the order of 25–50 *r* being recommended per sitting. It is perhaps unfortunate that no statistics regarding the results of these techniques are given. The problems of the X ray treatment of malignant disease are very cautiously treated, it being maintained that in many cases, almost most cases, the treatment is only palliative. The general considerations here given form a clear account of the fundamental difficulties, and it is insisted that the problems are not merely those of X ray technique, but call for careful regard of the patient as a whole. Where the techniques are given, there are suggestions for dosage in the treatment of malignant disease in various parts of the body.

The book is, unfortunately, not illustrated, and a few diagrams have replaced suitably some of the text. It is very well printed and produced, though proper names in the text seem sometimes unduly Germanised. A bibliography is included, and appears a reasonable selection from the mass of material available.

The Chest in Children Roentgenologically Considered.

By E. GORDON STOLOFF, M.D. Foreword by BELA SCHICK, M.D. Annals of Roentgenology. Vol. XII. New York: P. B. Hoeber. Pp. 432. $15.

THIS study is largely a clinical one, by an author who is displayed as an expert radiologist as well as a sound clinician. This combination of specialties is rare in England where it is considered to be an advantage for the patient to have the opinions of two medical men who look at his case from different angles. Much labour has evidently been devoted to this work and many of the observations extend over a long period of time. The serial radiograms are of great value in the study of the evolution of certain pathological processes, particularly tubercle and the pneumonias. It is especially difficult to get good radiograms of the chest in children. In view of the excellent quality of these it is disappointing that little is said about technique. It would be interesting to know the focus-film distance used, whether 6 ft. or the more American fashion of 4 ft. Another omission is the lack of reference to appearances found in radiograms of the normal chest in children of various ages.

A detailed description of the topography of the interlobar fissures is given, many radiograms, anterior and lateral, illustrating interlobar effusions, and others showing the variations of technique which enable pathological changes in the large interlobar fissure to be interpreted. The importance of the lordotic position is well seen. It is not quite clear whether the author believes it possible to visualise these fissures in normal radiograms, the lesser in postero-anterior, and the greater in lateral views. In Fig. 177, the author refers to a *hair-line pleural thickening* of the small interlobar fissure; as a matter of fact a similar hair-line is seen in other radiograms throughout the book, particularly in Fig. 75. It is likely that these fissures can be visualised in 80 to 90 per cent. of radiograms of the healthy chest. A large and important section of the book, with many serial radiograms, illustrates the evolution of the primary tuberculous complex in children—that is the primary focus, with its regional lymph nodes. This conception of the development of the lesion we owe to Ghon and Hamburger, and to the work of the last-named authority at least some reference should have been made.

Such extreme enlargements of lymph nodes as are illustrated in this book are uncommon in infants and young children in England. When the primary focus is invisible these minor lymph node enlargements may indicate possible localisation of the primary focus. As Parrot put it—these lymph nodes act as "mirrors of the lungs." In common with other American workers, Dr. Stoloff apparently devotes much attention to the radiological study of the more acute chest conditions, particularly the pneumonias. He reproduces interesting serial radiograms of a

(*Continued from previous page.*)

Demonstrations included the following:—R. J. V. PULVERTAFT (London): (1) A gumma of the thyroid gland in a girl of 18. (2) Leiomyoma of the renal pelvis. C. POLSON (Leeds): (1) Complete (post-traumatic) stenosis of the larynx. (2) Hæmochromatosis and primary cancer of the liver. H. ROGERS (Bristol): Bilateral suprarenal tuberculosis with a tuberculoma of the basal ganglia of the brain. H. E. HARDING (Sheffield): (1) A large cyst of the spleen containing mucoid material and lined by squamous epithelium. (2) An unusual mass in an epididymis: ? granulomatous, ? neoplastic. H. H. GLEAVE (Liverpool): Periarteritis nodosa. ELIZABETH H. LEPPER (London): The use of tellurite-containing medium for the isolation of streptococci. T. HARE (London): Foot-and-mouth disease lesions in the ear epidermis of inoculated guinea-pigs. F. A. KNOTT (London): (1) Specimen and sections of Gaucher's splenomegaly (splenectomy). (2) Specimen and sections of active ulcerative colitis (colectomy). JOAN M. ROSS (London): (1) Chorion-epithelioma secondary to a testicular tumour. (2) A further case of splenomegaly of unusual type. (3) Primary carcinoma of the Fallopian tube. C. OLDFIELD and M. J. STEWART (Leeds): (1) Endometriosis carcinomatosa. (2) Liposarcoma of broad ligament. ELLA M. HICKMAN (Leeds): Neurofibromatous epulis.

condition arising in the course of pneumonia, which he calls "aseptic" or "aputrid" necrosis.

This is a most comprehensive work deserving close study.

Recent Advances in Organic Chemistry.

Sixth edition. By ALFRED W. STEWART, D.Sc., Professor of Chemistry in the Queen's University of Belfast. London: Longmans, Green and Co. 1931. In two volumes. Pp. 421 and 432. 21*s.* each volume.

To all interested in the development of organic chemistry these summaries by Prof. Stewart are invaluable; his style is always lucid and his choice of material excellent. The first volume contains matter suitable for third-year students and forms an introduction to the second which is intended for Honours students and post-graduate workers. Vol. I. opens with a short historical survey of the main lines of progress of organic chemistry in the latter half of the nineteenth century while the first chapter of Vol. II. deals with the advances of the last 25 years. Amongst the fresh subjects treated are several of interest to the pure organic chemist such as strainless carbon rings and a number of terpenes and alkaloids. Medical readers will look in vain for summaries of the chemistry of the vitamins, hormones, and allied substances.

Quantitative Organic Microanalysis.

By FRITZ PREGL, D.Sc., Ph.D., Professor of Medicinal Chemistry; Principal of the Medico-Chemical Institute of the University of Graz. Second English edition translated from the third revised and enlarged German edition, by ERNEST FYLEMAN, B.Sc., Ph.D., F.I.C., Consulting Chemist, Sutton, Surrey. London: J. and A. Churchill. Pp. 237. 15*s.*

THE methods of Prof. Pregl are so well known as now to be regarded as classical. The English translation of his book, which appeared some years ago, became authoritative among works on quantitative organic analysis. In the third German edition on which Dr. Fyleman's present translation is based, many of the chapters have been rewritten, and it is particularly interesting to see that Prof. Pregl has shown good judgment in selecting for revision just those which contained matters puzzling to the beginner. He has added an interesting and important section on the identification of organic compounds and groups. The work is a very valuable one and the translation is good.

Text-book of General Bacteriology.

Tenth edition. By EDWIN O. JORDAN, Ph.D., Professor of Bacteriology in the University of Chicago and in Rush Medical College. London: W. B. Saunders Co., Ltd. 1931. Pp. 819. 28*s.*

GOOD text-books, unlike old soldiers, are not immortal. A few, in the hands of succeeding generations of editors, seem continuously to renew their youth but it is the fate of the majority that, after flourishing for a certain period, they appear no more. This is not really strange, for it is often a harder task to revise a book effectively than it can ever have been to write it. The introduction of new matter into an existing framework and the adaptation of chapters which must be modified, and yet are too good to be sacrificed and rewritten, imposes a great strain upon the ingenuity, commonsense, and pride of an author; so that as a book ages it often degenerates from a continued narrative into something of a scrap-book and thus passes to its doom. No such improvisations and makeshift alterations are to be found in Jordan's text-book. It remains a most admirably lucid exposition of this subject; short, concise, yet covering a wider field than most text-books of bacteriology which come into the hands of medical students. One of its major virtues is that subjects on the edge of medical bacteriology, and those verging towards the more technical aspects of the subject, are especially well treated. Certain criticisms might be made. The important subject of bacterial variation is barely touched upon, whilst the use of the term "phase" in speaking of the S⇌R states is unfortunate, since it has been widely adopted, at least in this country, for the H-antigenic type and group states of certain Salmonella which were discovered by Andrewes. The type of filter illustrated in Fig. 43 is not one in common use, whilst the sense in which the term "mixed and secondary" infections (p. 143) is employed is hardly the usual one. Such blemishes are few and are not serious.

This is indeed a fine mellow book, well balanced pleasant to read, and beautifully produced.

Experimental Syphilis and Frambœsia.

With Special Reference to the Comparative Pathology and Immunology. By S. MATSUMOTO, Professor of Dermatology and Syphilology, Kyoto Imperial University. Kyoto: Instit. Dermatosyphil. Universitas. Imperialis. Pp. 408.

IN this monograph the results of work on experimental syphilis in rabbits, including the comparative study of frambœsia and other spirochætoses are fully described by Dr. Matsumoto. The first part of the work is devoted to an exhaustive account of the macroscopical and microscopical appearances of the diseases considered, while the second part is concerned with immunity in rabbit and mouse spirochætoses. The author states that his purpose in publishing these experimental results is to show the basis on which his theories of "syphilis immunity" are founded. He developed this theory in a communication to the Eighth Congress for Dermatology and Syphilology held in Copenhagen on August 6th last. An interesting terminal section on sero-chemical changes is included. The monograph is illustrated by excellent photographs.

Sevenoaks Essays.

By GORDON WARD, M.D. London: Metcalfe and Cooper, Ltd. 1931. Pp. 316.

Dr. Gordon Ward in this collection of interesting and amusing essays is helping to discharge a national task—namely, the preservation of local records necessary for the historical understanding of much of our social environment to-day. The chapters represent gleanings from a large number o old documents which, for the most part, have found their way to the public library at Sevenoaks; no area is dealt with except that of the Sevenoaks Urban and District Councils or, in more ancient parlance, of the three Hundreds of Codsheath, Westerham, and Somerden. The limits thus laid down for himself by the author have been generously interpreted, for the material is of the most heterogeneous description, dealing now with the careers of local worthies, now with Roman remains, now with

the construction of palaces, and now with the demolition of cottages; we meet with kings and earls, yeomen and peasants, villains and eccentrics. An interesting little chapter on "beating the bounds" sets out examples of the curious landmarks that were employed to mark parish areas in comparatively recent times; several chapters describe interesting legal proceedings and others give amusing biographical and topographical information, when the preservation of the ancient spellings often gives force to the remarks.

Dr. Ward's object in writing this book has been to awaken interest in the study of old records and quicken efforts to preserve them, inasmuch as the contents of muniment rooms and other storage places are often in danger of destruction. Experience has shown that from such material the real history of the countryside can be gathered, while, as this volume shows, apparently dry-as-dust documents can be made interesting to the general public if the editor of their contents has the skill necessary for the work. Dr. Ward urges all who have documents of local interest to imitate the example of Lord Middleton who has given to the Sevenoaks library much that has found its way into this compilation.

Only one medical character receives more than a casual reference, and that is Dr. Thomas Fuller whose Latin epitaph can be read in St. Nicholas Church. He died two hundred years ago, and he wrote in the latter phase of his long life "Pharmacopœia Extemporanea, or a Body of Prescripts, in which Form of Select Remedies, accommodated to most Intentions of Cure usually occurring in Practice . . . and so on," from whose pages amusing and nauseating quotations are sometimes met with. He also wrote a book upon eruptive fevers, in which he pointed out how to diagnose flea-bites. The last of the Bosvilles of Bradbourne, a very old local family, made a curious will which has a medical interest. He lost the whole property by gambling, regained it presumably in similar manner, stopped play for ever and willed the property, first to a clerk in the India Office who had been polite in the payment of dividends, and then to his medical adviser.

The Scientific Detective and the Expert Witness.

By C. AINSWORTH MITCHELL, D.Sc.Oxf. Cambridge: W. Heffer and Sons, Ltd. 1931. Pp. 242. 3s. 6d.

THE machinations of the criminal and the investigations of the detective, professional or amateur, have become for the last few years a subject of highly popular interest, quite a proportion of popular reading for pleasure being represented in the pages of what are inclusively termed "shockers." The literary quality of these stories is extremely varied, being with some of the authors really high, and with a larger fraction quite low, but apparently readers medical or lay, may derive thrill or shock from each class, without feeling the difference. Indeed, the medical reader may now and again find in the most slovenly production, ingenious adaptations of medical and scientific possibilities together with audacious impossibilities, and, when preposterous episodes are detailed because a good story could not get on without them, gratitude is due to the author. But medical readers resent exercises of sheer fancy, when accompanied by detraction of their profession. This resentment is justified with monotonous frequency.

Dr. Ainsworth Mitchell has written a handbook which might serve as a source of inspiration to the intending parents of a shocker, for the plots of admirable stories of the kind will be found in his pages; he has provided a book of reference from which these authors could obtain exact instruction as to what they can and what they cannot make a villain do, while still conforming to right principles of science. The book contains an interesting chapter on graphology. Experts in handwriting have come in for a full share of the strictures that have been passed upon expert evidence in general, but Dr. Mitchell, in recording the work mainly of an American, Mr. A. S. Osborn, lays down rules for the detection of the forger of a very practical sort. The slips which the forger might make are so definitely pointed out that the publication of the information might be held to be dangerous. A criminal, who knew beforehand what are likely to be the main points of resemblance and the main points of difference brought forward, in a comparison of a genuine with a false document, would be on the alert to see that his fabrication passed the tests of such a parallel investigation.

ERRATUM.—On page 87 of our issue of Jan. 9th, in a review of Kessler's "Accidental Injuries," the number of pages is given as 71, the last figure having dropped out. The actual number of pages in the volume is 718.

REPORTS AND ANALYSES

RYVITA FLAKES.

(RYVITA CO. LTD., 96, SOUTHWARK-STREET, S.E.1.)

THE flakes are prepared from rye of the best quality by a heating process in which the starch, ordinarily insoluble, is rendered soluble, and is thereby easily digested and assimilated.

When analysed the flakes were found to have the composition:—

Carbohydrates (altered or dextrinised starch)	.. ..	78·94 per cent.
Protein (N × 6·25)	.. ..	9·60 ,, ,,
Moisture	.. ..	6·80 ,, ,,
Crude fibre	.. .. ..	1·72 ,, ,,
Fat	.. ..	1·40 ,, ,,
Ash	.. ..	1·54 ,, ,,
Calorie value per lb.	.. ..	1707

Nearly one-fifth of the material is soluble in cold water, indicating that the dextrinising process has been carried to a considerable extent.

The Ryvita flakes have an agreeable and palatable flavour; they may be consumed in a variety of ways, and constitute a new and useful addition to a light diet.

PRECAUTIONS AGAINST INFLUENZA IN IRELAND.—The Department of Local Government and Public Health of the Irish Free State has issued a circular-letter to the various local health authorities dealing with the precautions that should be taken to prevent the spread of influenza. Sanitary authorities are advised to formulate schemes for dealing with outbreaks of the disease, should they occur, and these schemes should include the coördination of medical and nursing facilities. Consideration should be given to the provision of hospital accommodation for severe cases. Acute primary pneumonia and influenzal pneumonia are already compulsorily notifiable, and the Department suggests that a system of voluntary notification of influenza should be established. The letter goes on to point out the usual modes of transmission of the infection of influenza by coughing, sneezing, loud talking, and warns against crowding in public resorts or public vehicles. Children from infected houses should not be allowed to attend school, and cases should be isolated if possible.

THE LANCET.

LONDON: SATURDAY, JANUARY 16, 1932.

THE PHYSICAL BASIS OF EDUCATION.

AT the last meeting of the Medical Officers of Schools Association a discussion took place on physical education in schools, which is reported in our columns this week. The debate was practical and timely. For it is held by those who have thought about the matter in its many aspects—and to every member of the medical profession the subject appeals from one angle or another—that a case has been made out for recognising that education, private and national, should take a more frank account of physical and physiological considerations. This was the thesis of an address recently delivered before the North of England Education Conference in Nottingham by Dr. R. H. CROWLEY, a senior medical officer of the Board of Education, who showed that during the last 25 years the term "physical basis of education" has received a huge extension of meaning. By the close of the last century some public appreciation had arrived that it was largely futile, and might even be inhuman, to impose systematic education on children suffering from such disabilities as hunger, pain, defective eyesight, adenoid overgrowths and tonsil infections, or physical exhaustion from employment out of school time. Such children must provide a physical basis of a most unsatisfactory kind for education, and the prevention and treatment of obvious and gross defects have been the object of strenuous work over the period mentioned—work which has been rewarded by substantial successes, as the annual evidence of medical officers of health and summarising reports of the Board of Education have been able to prove, with detailed figures in support of optimistic opinions. The risk is that we should be too readily content with happy achievement and be slow to perceive that medical inspection must now mean a great deal more than the detection and treatment of manifest physical disabilities. While it is true that the majority of children in the course of medical inspection can be passed on for treatment with little or no comment, there are many others where inspection in the school is the beginning only of our medical responsibility towards them. Taking eyesight as an example; we may quote Dr. CROWLEY. He says: "We must no longer be content with finding out by somewhat rough and ready means what defect of eyesight a child may have and then send him to the oculist for treatment. This is analogous to what we used to do with the cripple child, and to what we still do in a large measure with the child with heart disease, though our practice in this respect shows we are learning the lesson the cripple child has taught us. More careful inspection of the visual capacity of the young child is the necessary precursor to any more effective prevention of defective eyesight, and to understanding of healthy vision." Now the understanding of healthy vision is linked up not only with the physiology of the child, but with the academic curriculum which he undergoes, and his material environment, and similarly we have come to perceive that the physical basis of education has always these large implications.

The discussion before the Medical Officers of Schools Association and Dr. CROWLEY'S address at Nottingham are both illuminated by a correspondence which has been running sporadically through the columns of the *Times* for the past three months. This correspondence started in a challenging speech made by Lord DAWSON at the opening, last October, of the new sanatorium at Epsom College, when he pointed out that the medical officers of schools, and doctors called in attendance upon schoolboys, might well make a study of the principles of physical education, their duties not being limited to the care of the sick. On this text medical officers of schools, headmasters, instructors of physical training, parents as represented by the Parents Association, the Schoolmasters Education Association, and other representative individuals and groups have been expressing many views, mostly concordant, and, when otherwise, supplying arguments in support of their words. From these letters one message emerges, which can be summarised in the phrase with which Mr. MORTIMER BOOTH, the physical instructor at Christ's Hospital, opened the debate before the Medical Officers of Schools Association, when he pointed out that the relation of the physical to the mental development of the boy must always be kept in mind. The Consultative Committee of the Board of Education have issued valuable reports on "The Primary School" and on "The Education of the Adolescent," which imply or indicate the need for basing the process of education from early years upwards upon a physiological basis. That we have been getting nearer to this attitude for the last 50 years is sure, and as a practical development Dr. CROWLEY now makes the suggestion that special educational methods should be adopted for children between the ages of 7 and 11, believing that the characteristics of this age-group have a particular significance, it being a period of comparative stability, of resistance to unfavourable conditions, and of consolidation of muscles and nerve connexions. This is a period in the child's life which precedes the time when physical education usually becomes part of educational routine—definitely it is a period anterior to public school life; it is therefore useful to be reminded that "adolescence has its roots as well as its fruits."

To provide a physical basis for education is not

[1] THE LANCET, 1931, ii., 807.

only to see that the calls for adequate food, proper ventilation, and due opportunities for exercise are well met. It is to see that throughout the education period there is an environment provided which will give physical education its proper chance, so that, in reciprocity, the educational curriculum may yield good results. A public sentiment is needed that good physical conditions are not so much a basis upon which education should be founded as a natural concomitant with which education must proceed. The recent letters in the *Times*, and various articles and reports which form stock reading in our columns, show that to secure this harmonious situation certain differences of opinion have to be smoothed out, but the process should not be hard. There are at the present moment points at issue between persons who have a right to consider themselves and to be considered of equal authority. Drill upon the Army pattern is spoken highly of, on one hand, as the kindergarten of physical organisation, and, on the other, is stigmatised as dull drudgery. Mr. JACKS, the headmaster of Mill Hill School, whose opinion carries weight in all educational circles, considers that, while a department should be created for the provision of adequate physical instructors, the school doctor, though an essential partner, should not be in charge of the department; this is a view running counter to that expressed by Dr. MURRAY LEVICK, who is an equally experienced counsellor. In the shaping of sanitary environment the medical officer of the school would naturally advise the authorities concerning heating and ventilation of premises, while his estimates of the quality of the children's food and the duration and pattern of their hours of study should be taken into account. In the shaping of physical education his position as an essential partner with the instructor might be easy to define; but it is hard to allot him a more definite position than that of an intelligent friend, when it comes to the arrangement with housemasters and headmasters of the details of housekeeping or the time-sheets of study. We are speaking here, of course, of the public schools, and there is nothing even in those strongholds of individualism that should not be capable of adjustment between persons having before them the common object of benefiting youth; in the State schools the same difficulties would not arise. Coöperative work between the school doctor and the physical instructor will be advanced by the better opportunities that are now being offered to the latter. The University of London has instituted a special diploma for physical education, which is open to candidates from approved centres, and the possession of the diploma will give the physical instructor a proper academic position on the staff of his institution. At the same time the Trustees of the Carnegie United Kingdom Trust have discussed the situation with representatives of local educational bodies and with the Board of Education and the resulting developments at Leeds are full of promise. From all of which it is to be seen that the need for a physical basis in our educational organisation is now not only admitted but being met along many practical lines.

THE SURGICAL REVOLUTION.

SURGEONS of long experience, when they contemplate the methods which were in vogue during the early years of their career, cannot fail to be impressed with the complete change in the outlook for many patients who must of necessity submit to an operation. Prostatectomy was at one time an extremely hazardous procedure; cholecystectomy was a dangerous undertaking, gastrectomy exacted a heavy toll; whilst thyroidectomy for exophthalmic goitre was so full of risk that it practically had no place in surgery. With respect to all these operations the prognosis has entirely altered, and it is instructive to ponder the factors which have brought about such astonishing advances. Refinement in technique has no doubt played its part, but modern surgeons would hardly claim to be better craftsmen than such masters as BILLROTH, DOYEN, or HORSLEY. It is likely that the greatest factor is the change in our mental attitude towards operation—notably a realisation that mechanical factors do not always play a major part, and often a very small part, in the restoration of the patient to health. Anatomy is as essential as ever, but physiology and the reaction of vital processes to altered mechanical relations have become recognised as of supreme import. Gastro-jejunostomy, for example, is more than a drainage operation, and the retention of urine due to an enlarged prostate has far more momentous effects upon kidney function than the mere mechanical distension of the renal pelvis. The study of the alteration of function of vital organs, the demonstration of the great reserve strength they possess, and the development of means of restoring their activity have placed in the surgeon's hands precautionary measures of immeasurable value. There has grown up a system of treatment before and after operation which is based upon solid foundations.

The extent to which modern surgical practice has been influenced by the development of our knowledge of physiology and pathology is made clear in the comprehensive series of articles by Dr. R. A. CUTTING on the principles of pre-operative and post-operative treatment which have been appearing during 1931 in the *American Journal of Surgery*. The format and double pagination of these articles, of which the last was published in the December issue of the journal, show that they are designed to form a book, and the volume will be a welcome addition to surgical literature. The last section of the work contains chapters on extensive superficial burns, on acute traumatic cranio-cerebral injuries, and on intestinal obstruction. In connexion with severe burns emphasis is laid on need for treatment of shock by morphine in large dosage, by the maintenance of heat, and by the promotion of quiet and rest. The local trauma is relatively unimportant, as far as immediate treatment is concerned, since toxic absorption does not occur for several hours. For extensive superficial burns tannic acid is recommended to the exclusion of any other local application. Its advantages in preventing the develop-

ment of toxæmia are stressed, but Dr. CUTTING does not pretend that the coagulation of toxins can be relied on to make systemic treatment unnecessary. Blood transfusion, the administration of saline solution in large quantities (4000 to 5000 c.cm.), and of dextrose are called for in severe cases, supplemented perhaps by such radiation as can be provided from an electric light tent, the use of which is recommended on other grounds. In the treatment of head injuries, attention is drawn especially to the relative importance of injuries to the contents of the skull and the relative unimportance of skull fractures as such. The interpretation of symptoms on the basis of the pathological physiology is outlined, and the non-surgical treatment of increased intracranial pressure by dehydration and by lumbar puncture is discussed as well as the indications for a decompression operation. The chapter on ileus is rather disappointing, for Dr. CUTTING can give but little new information on the prophylactic or curative treatment of this condition, or in the treatment of the toxæmia of ileus, which is still almost entirely symptomatic. But he does show how the patient's discomfort can be relieved, and makes a useful point in drawing attention to the futility of using epinephrin or ephedrine in conjunction with splanchnic or spinal analgesia for the relief of ileus, since these drugs overcome the effect of the analgesia.[1]

No better instances of the advances in pre-operative and post-operative treatment could be given than the strides which have been made in the surgery of diabetes and the hypertrophied prostate which Dr. CUTTING dealt with in a previous contribution to the series. Not many years ago the smallest surgical intervention in a diabetic was looked upon with horror and apprehension, for about 50 per cent. of the patients died. Now the mortality is less than 5 per cent. This has been brought about by: (1) standardising the diet of each particular patient; (2) giving an adequate dose of insulin; (3) encouraging the patient to take food almost up to the time of the operation, for starvation leads to ketosis; (4) giving a pre-operative dose of dextrose together with a sufficient amount of insulin; (5) using minimal amounts of anæsthetic, never chloroform, preferably nitrous oxide, and best of all a local anæsthetic; (6) giving of dextrose, after operation, all of which measures are the outcome of physiological experiment in animals and chemical investigations of the blood in man.

The patient with an enlarged prostate is always in the later decades of life, and the inevitable degenerations have occurred in his circulatory and other essential systems. Their effect has been increased by urinary retention, with the toxæmia it produces. The remarkable reserve power which the kidneys are known to possess may be all but used up before the patient is aware that anything is amiss, but the degree of danger can be estimated by means of two routine tests: (1) the power of concentrating urea in the urine, and (2) the level of urea in the blood. So far as the kidneys are concerned it is now known that if the pressure against which they have to secrete is gradually lowered, latent powers of recovery are allowed play, and renal function will return to normal or nearly normal level, often with surprising speed. This discovery formed the basis for the two-stage operation which has saved innumerable lives. The performance of a preliminary operation to gain this end, however, is now regarded as unnecessary by an increasing number of surgeons, for it has been proved that catheter drainage is as effective as a suprapubic opening in more than three-quarters of the cases. The problem of the damaged kidney has thus been largely solved. It is not so with some of the other disturbances, which may be present in patients with prostatic enlargement. Every effort should be made to estimate the condition of the cardiac muscle; for this, unfortunately, no very reliable test is as yet available. A hæmoglobin estimation should be carried out. The chronic interstitial nephritis from which all these patients suffer causes an anæmia which is the more serious inasmuch as the amount of hæmorrhage during the operation, and subsequently, cannot be foretold or certainly controlled. Enough has been said to show that slowly yet surely a revolution has been taking place in surgical outlook, surgical treatment, and surgical prognosis. This is true of every province of surgery. The cruel withholding of fluids after laparotomy, the painful, unnecessary, and harmful purging both before and after operation, the unkindly restraint, are things of the past. The sufferer from an abdominal complaint necessitating a surgical operation may well be thankful he was not born 50 years before.

[1] Ochsner, A., Gage, I. M., and Cutting, R. A.: Jour. Amer. Med. Assoc., 1928, xc., 1847.

THE LICENSING COMMISSION.

THE Report of the Royal Commission on Licensing is an interesting and a surprising document. The surprising feature is the degree of unanimity achieved by a body selected to include extremes of temperance and trade opinion in addition to other members who might have been expected to hold preconceived ideas on the subject. The result is a tribute not only to the able chairmanship of Lord AMULREE, but also to the strength of the evidence which brought 16 out of 19 members into the fold of the Majority Report. Of the three Minority Reports, one, that of Mrs. SIMON, is in substantial agreement with most of the conclusions of the majority, but would go more quickly in the direction of the public ownership to which the Majority Report quite definitely points. The other two Minority Reports are those of one of the brewing trade representatives and of the retailers' representative respectively. Another representative of the liquor trade, also a brewer, signs the Majority Report with certain reservations.

When the Commission was appointed in 1929 it was suggested, not in pro-trade quarters alone, that the Labour Government had successfully shelved the question because so diverse a team would never produce any effective result. Events

have certainly saved the Labour Government the trouble of dealing with the Report which, however, completely belies those anticipations. The Report is likely to form the basis of legislation in the future to a greater or less extent according to the character of the Government which eventually tackles the problem. It is certainly unlikely that the present Government will find time for legislation on the lines of the Report.

After giving full weight to the great general improvement in sobriety which has taken place during the present century, and particularly since the war, the Report states that excessive drinking still persists in large measure, and that apart from actual intemperance, expenditure on intoxicants still reaches a definitely uneconomic figure. Some startling figures are mentioned in support of the latter contention. The annual expenditure on drink in an industrial metropolitan borough was stated in evidence to be reliably estimated at £1,200,000 or an amount of 16*s*. per week for each family, and £17 per annum for every adult over 20. This in a borough where the average employed wage is put at approximately £2 5*s*. a week. The problem, then, is still substantial, and in the forefront of the proposals for improvement the Report places "the provision of machinery for achieving much more rapid reduction of licences—"more rapid, that is, than has been achieved by the 1904 Act. This is to be brought about by, inter alia, an increase of the levy up to a maximum of three times the existing rate. It is satisfactory to observe that the Report particularly stresses the need for "more effective encouragement and more rapid development of the policy of public-house improvement, and in particular of the conception of the public-house as a place of general refreshment rather than as a place primarily devoted to the sale of alcohol." This is a policy which will be warmly approved by public opinion generally, and it is of great interest to note that, after fully reviewing the relative advantages and disadvantages of private enterprise and public ownership more particularly in relation to the policy above defined, the Report comes down on the side of public ownership, though it is on this point that certain of its signatories append reservations. The line of agreement by which the majority arrive at their conclusion is illustrated by the following quotation:—

> "While recognising fully the efforts of the best elements in the Trade to improve their houses in accordance with modern ideas and tendencies . . . it is impossible to get away from the fact that the ruling motive of the brewer, who is the owner of the vast majority of existing publichouses, must necessarily be promotion of the sale of the goods in which he is chiefly interested; and it would be unnatural to expect the Trade as a whole, left to itself, to lead public opinion in the matter of the conversion of the publichouse into a place where the sale of intoxicants is to take a secondary position."

The financial circumstances of the time are held to preclude universal State acquisition of the liquor trade at present, but extension of public ownership is recommended though not on precisely the lines existing in the Carlisle area. The suggestion is probably wise that direct State management should be modified in the direction of management by a body established as nearly as possible on business lines but with due provision for the element of social welfare. Mrs. SIMON's Minority Report is of special interest in this connexion presenting, as it does, a comprehensive scheme for public ownership which appears to surmount the two objections most commonly urged against that course, viz., (1) the burden on the exchequer of cash payments or guarantees of vast sums, and (2) direct State management of the liquor business. The London Passenger Transport Bill is the model on which the scheme is based, payment for the interests taken over to be made in the form of "Licensing Stock." The essential feature of the scheme, says Mrs. SIMON, "is the transfer of the control of the sale of alcoholic liquor from the private interests in which it is at present vested to a Statutory Body constituted for the purpose by Parliament but not in itself a State Department."

Another matter of general interest dealt with in the Majority Report is that of permitted hours of sale. Restriction in hours of sale was first introduced as a war measure, and after recording the conviction that restriction has been of great value in promoting sobriety the Report states the considered opinion that the present scheme is acceptable to a vast section of the public, including public-house clients, and is becoming more and not less so. This represents a significant change in public opinion which is likely to support the proposal of the Report that the general closing hour should be 10 P.M., subject to the provision of special facilities in restaurants and hotels, especially in London theatre-land. The scheme proposed to meet such cases appears both reasonable and workable. Regarding clubs, the Report favours a considerable tightening up of the present law, and, if adopted, the recommendations will do much to remedy an admitted abuse. It is regarded as indispensable that powers of entry into registered clubs should be conferred on the police, and that among the essential conditions precedent to registration is to be the absence of any "tie." The Report suggests that well-conducted clubs should not resent a control which without embarrassing them will assist in eliminating undesirable clubs. The tied house system as a whole comes in for severe criticism, and modifications of the law are suggested in the direction of improving the position of the licensee vis-à-vis the owner-brewer. These recommendations, if carried into effect, should do much to secure improved service for the public. Few will be found to quarrel with the desire expressed in the Report for more definite encouragement of specific education on the subject of alcohol, but the present time is hardly propitious for the execution of the only one of the main recommendations which has not, so far, been referred to—viz., the proposal for the establishment of a National Licensing Commission. Nevertheless, the case for this proposal, like all the other recommendations in the Report, is moderately set out and so impartially argued that it should receive very careful consideration. The Report will be welcomed by all who are genuinely seeking an advance in the highly important matter of temperance reform.

ANNOTATIONS

ERRORS IN CERTIFICATION.

IN three cases, summarised in another column, the East Sussex Insurance Committee has recently found practitioners at fault for issuing certificates containing false and misleading statements. In each case he had given a series of monthly certificates, on the special forms provided for the purpose, stating that he had examined the patient on a particular date though he had in fact not seen the patient professionally during the period covered by the certificates. As it happened, no great harm was done. In each case the patient was suffering from chronic disease which caused incapacity for work during the period. In each case the practitioner was justified in issuing special monthly certificates. In no case was the approved society prejudiced by the payment of benefit following upon the certification of continuing incapacity. In no case was the practitioner asked to visit the patient. In no case was treatment required to alleviate pain or to prevent suffering. In no case was there much, if any, prospect of active treatment arresting disease. Fortunately it is clear that these three cases were not the most serious imaginable. But it is equally clear that any inaccurate certification is serious enough at a time when supervision over the distribution of millions of pounds in sickness and disablement benefit should more than ever be punctiliously exercised. These great sums are dispersed largely upon the evidence of insurance practitioners' certificates.

National health insurance certification is neither a trivial formality nor a merely clerical matter. The good-natured desire to avoid giving trouble looks ludicrously inadequate if, when the facts almost inevitably come to light, it is the only available explanation for the untrue statement that a doctor has examined a patient. If insurance work is undertaken, the game must be played according to the rules. One rule requires a periodical certificate to be given on a special form; the form incorporates a declaration that the certifying doctor has examined the patient. At present our fellow-citizens are prepared to accept a medical practitioner's signature as a guarantee that the certified statements may be relied upon as truthful. While it is easy to be pontifical at the expense of hard-worked panel doctors, we ask them not to let these cases recur. No special "Warning Notice" is needed by way of reminder that, if our guarantees cease to be worth their face value, the consequences must be grave both for the individual and for the whole profession.

PANCREATIC TUMOURS AND HYPOGLYCÆMIA

AN apparently normal pancreas is a common enough finding at autopsy in fatal cases of diabetes, and with the ordinary histological methods usually employed a microscopical examination may show no signs of disease. In fact, there may be less structural change to account for prolonged and serious symptoms in diabetes than in any other chronic disease. In the current number of the *American Journal of Pathology* (1931, vii., 723) Dr. Margaret G. Smith and Dr. Marshall G. Seibel suggest that anatomical evidence of the association of the pancreas with carbohydrate metabolism may be forthcoming more frequently than is usually supposed. In 1927 R. M. Wilder and his collaborators published a remarkable case of carcinoma of the islands of the pancreas associated with hyperinsulism and hypoglycæmia. The patient required hourly doses of glucose to prevent hypoglycæmic convulsions, and when the necessary sugar was delayed the blood-sugar fell below 0·03 per cent. Only a few other examples of island tumours have been reported in the literature, but Dr. Smith and Dr. Seibel suggest that they are not really uncommon. They themselves describe five cases. In four of them the tumours were quite small, 1 cm. or less in diameter, and might well have been overlooked. The fifth case was apparently diagnosed in life; it was at any rate removed by operation from a young boy who had shown characteristic symptoms of hypoglycæmia for eighteen months. This tumour was situated in the body of the pancreas and measured 2 by 1·5 cm. Of the other cases, one showed signs of hypoglycæmia and the blood-sugar estimated just before death was 58 mg. per 100 c.cm.; another, who died from pulmonary embolism following lobar pneumonia, behaved like a total diabetic during her last illness. The remaining two presented no very definite signs of a pancreatic lesion during life. Some of the previously recorded cases have been described as low-grade carcinomata, and Wilder's tumour had disseminated to the liver and lymph nodes; but Dr. Smith and Dr. Seibel regard their tumours as adenomata, and from the descriptions given none of them appears to show any evidence of malignancy. There seems no doubt that they are composed of island cells and consist largely of abnormal beta cells, but it is interesting to note that of two cases which presented tumours identical macroscopically and microscopically, one showed signs of hypoglycæmia, while the other gave no evidence at all of disordered metabolism. Whether it secretes insulin or not the tumour appears to have no stimulating influence on the normal island cells in the rest of the gland; these, anatomically, are quite unaltered, though clinical studies of the sugar tolerance suggest that in some cases their activity may be depressed.

BRITISH SPAS AND SEASIDE RESORTS.

THE primary purpose for which the Medical Directory is consulted is reference to personnel—and the very bulk of the sections devoted to British doctors is liable to obscure the other matter. One of the sections, which contains a medical report on British spas and seaside resorts, by Dr. R. Fortescue Fox, has been reprinted as a pamphlet,[1] in which convenient form it reveals a message peculiarly appropriate to the present times. Excluding the New Zealand spas—which in a future edition might well be supplemented by spas in the other Dominions or omitted—some 130 spas and health resorts are dealt with. These are indexed alphabetically from Aberdovey to Yarmouth, but in the text are classified into the following subsections: The Principal British Spas (11); Other Inland Health Resorts (26); Health Resorts of the British Coasts: North-Western Group (23); South-Western Group (23); Southern Group (13); South-Eastern Group (13); Eastern Group (20). The information given includes some account of the situation and climate, season, natural waters (where these exist), sea-bathing in coastal resorts, medical indications, and brief notes on the accommodation available, with references to the advertisement pages

[1] London: J. and A. Churchill. 1931. Pp. 95. 1s.

where further details are supplied by the hotelliers. This compendium of useful information is made the more valuable by the concise introductory notes, supplied by the author from his rich experience, on the choice of medicinal waters and spas, and on the general and specific indications for the selection of any spa. Dr. Fox points out that the principal considerations that may influence the practitioner in selecting a resort for a patient may be the eliminating quality of its waters, or their other qualities, the methods of external or thermal treatment provided, and the climate, amenities, and medical service. Sometimes one, sometimes another of these points predominates. At this season it is well to be reminded (page 5) that for chilly persons a course of thermal baths may have much the same stimulating effect as a change of climate, and may enable delicate workers to get comfortably through the winter. Dr. Fox adds, however, that if success is to be achieved all exposure to cold during treatment should be avoided, and that not only the bath establishments, but the hotel or dwelling-house where the "chilly person" is accommodated must be artificially warmed to summer temperature. This warning is still unheeded in too many places in this country, but an increasing number of hotels are now providing such amenities as central heating, lifts, and constant hot water in the bedrooms. The reward of installing these conveniences should be to attract many more people to follow the advice given on the cover of this pamphlet—that is, to seek the soft Atlantic airs in spring and winter, the strong Eastern airs in summer and autumn, and the sunny South coast in all seasons.

IS CANCER PREVENTABLE?

A FEW years ago we commented in these columns [1] on a paper by Dr. A. L. Wolbarst, of New York, in which he claimed to have proved that cancer of the penis never occurs in persons who have been circumcised in infancy. We then expressed a lingering doubt whether the statistical data on which the argument was based were sufficiently reliable. Since then Dr. M. Sorsby,[2] in his study on the incidence of cancer among Jews, has shown that Jews and Mohammedans enjoy complete freedom from cancer of the penis, and in this issue Dr. Wolbarst contributes further evidence which establishes this fact beyond doubt. He shows, moreover, that this freedom from cancer of the penis is due to the greater cleanliness made possible by circumcision. Circumcision is, therefore, to be recommended from many points of view as a measure of general hygiene. In civilised countries cancer of the penis is rare, while in the native races of the East who do not practise circumcision it is relatively common. In England and Wales, with an annual death-rate from cancer of about 26,000 men, only about 150, or 0·6 per cent., die from cancer of the penis. This difference is again due to greater cleanliness. Numerically, therefore, the general adoption of circumcision in this country would not materially diminish the general mortality from cancer. The great significance of these findings seems to us to lie rather in the demonstration of the fact that cancer is a preventable disease. For penile cancer the means of prevention are simple—namely, hygienic care by circumcision. But if hygienic care can prevent cancer in one organ why should it not do so also in other organs? For Jewish women observing the Mosaic code Dr. Sorsby demonstrated a lower incidence of cancer of the uterus as compared with Gentiles, and ascribed it to the insistence of the Mosaic code on sexual hygiene. Some years ago Dr. T. H. C. Stevenson [3] showed that cancer of the upper alimentary tract, from the lips to and including the stomach, is twice as common in the lowest social classes as in the higher social classes, but no difference whatever was found between the two classes for the incidence of cancer in the lower alimentary tract, from the stomach downwards. Quite recently Dr. W. Cramer [4] has demonstrated from a comparison of international statistics that cancer of the stomach is more than twice as frequent in a number of Central European countries as it is in this country. Apparently there are groups of populations in Europe in which the incidence from cancer of the stomach is so high that of three people who die from cancer two die from cancer of the stomach, while in this country on the average out of four people who die from cancer only one dies from gastric cancer. Dr. Cramer argues from this that in those groups where the incidence from gastric cancer is high, a large proportion of the cases must be due to extraneous factors which are avoidable. Evidence is therefore gradually accumulating which indicates that for a number of organs cancer is, within limits, a disease which can be prevented by paying attention to the general hygiene of each particular organ throughout life.

[1] THE LANCET, 1927, i., 39.

[2] Cancer and Race. London. 1931; see THE LANCET, 1931, i., 1198.

DIGITALIS IN HEART DISEASE.

SINCE the nature of auricular fibrillation was understood it has been generally recognised that it is in this type of heart failure that digitalis has its greatest effect. Some observers even consider that this condition is the only true indication for digitalis therapy. Most cardiologists, however, are agreed that its administration is useful in congestive heart failure with normal rhythm, sometimes known as right ventricular failure, although admitting that it does not produce such consistently striking results as in auricular fibrillation. For some time now these two conditions have been generally regarded as the only two types of heart disease in which the use of digitalis is desirable. It was therefore somewhat surprising to find White stating in his recent monograph [5] that he considered efficient digitalisation and its maintenance, together with rest and restricted activity, of the greatest value in abolishing attacks of cardiac asthma or in reducing their frequency. Harrison, Calhoun, and Turley [6] have now investigated the effects of digitalis in ambulatory patients, with little or no œdema, who suffered from attacks of cardiac asthma or from dyspnœa on slight exertion—so-called left ventricular failure. They found that in those with paroxysmal nocturnal dyspnœa (cardiac asthma) the administration of digitalis had a notably beneficial effect. Of 19 treated, one was worse, two were much improved, while in the remaining 16 the attacks were completely abolished, several cases having now been free from attacks for over two years. Thus this investigation fully corroborates White's statement. As regards the patients with dyspnœa on exertion the results of digitalis therapy were much less remarkable, and were more difficult to assess

[3] Registrar General's Decennial Supplement England and Wales, 1921. London. 1927. Part II. Pp. 27.

[4] Zeit. f. Krebsforschung, 1931, xxxiv., 531.

[5] White, P. D.: Heart Disease, New York, 1931, p. 594.

[6] Harrison, T. R., Calhoun, J. A., and Turley, F. C.: Arch. Int. Med., Dec., 1931, p. 1203.

since it is difficult to express dyspnœa quantitatively. Of 43 patients studied two were worse, 12 noted no difference, while 14 stated that the same exertion produced less discomfort, and 15 were cured to the extent that the ordinary exertions of everyday life caused no respiratory embarrassment. An attempt was made, in eight patients, to control these subjective results by estimation of the vital capacity and the ventilation index. Of the seven who expressed themselves as better or relieved all showed a fall in the ventilation index, whereas in the case of the one patient who said he was more easily dyspnœic after taking digitalis the ventilation index was markedly increased. Thus from these investigations it seems that the indications for digitalis therapy in heart disease must be widened, and that many patients with troublesome symptoms might be relieved by its timely administration.

THE NON-TUBERCULOUS SILICOTIC COAL-MINER.

THE incidence of pulmonary tuberculosis among coal-miners is becoming a matter of considerable importance. For years those who have been interested in industrial pneumokoniosis have assumed that coal-miners do not suffer from any pulmonary disability as the result of their occupation. It is true that there is a high incidence of bronchitis among coal-miners in the later decades of life, but tuberculosis, which is recognised all the world over as the outstanding risk of those who work in dusty occupations, does not appear to occur more frequently among colliers than among other members of the population, but rather the reverse. The dust which is particularly associated with phthisis is silica, usually in the crystalline form, and it has been assumed either that coal-miners are not exposed to siliceous dusts, or, if they are, that damage to the lungs does not follow because of the protective action of the associated coal dust. Of recent years, however, it has been shown by S. Lyle Cummins and A. F. Sladden that silicosis actually does occur among men occupied in certain types of coal-mining. Why, then, is phthisis not more common among them? Silica, of course, is only one of the factors which may influence adversely the progress of a tuberculous infection; it does not necessarily constitute the whole of the story. Physical fitness and adequate nutrition may presumably be expected to act potently on the defensive side, and may do much to counterbalance the influence of the silica. Coal-mining is an arduous occupation and the physically unfit are weeded out at an early stage; while except during the recent years of depression the economic condition of the miner when in work, with all that that entails, has been above the average. But physical fitness and a high economic standard have not prevented miner's phthisis in South Africa and elsewhere, and the question why coal-miners are exempt still remains to be answered. In point of fact there is evidence that in certain coal-fields, at any rate, this freedom from tuberculosis does not obtain; and it is possible that the data upon which the statistics relating to the industry as a whole have been based have been accepted without sufficient scrutiny. The whole subject bristles with difficulties and is in urgent need of reconsideration. In a paper in a recent number of the *Journal of Hygiene*, Prof. S. Lyle Cummins and Dr. C. Weatherall[1] suggest that the coal-miner may be protected to some extent from pulmonary tuberculosis by the adsorptive power of the coal dust with which his lung is saturated. It has been demonstrated that finely divided charcoal has the power in vitro of adsorbing from tuberculin the constituent on which its activity depends. Following up this suggestion the authors have performed the following ingenious experiments. Dilute solutions of old tuberculin were saturated with powdered anthracite coal for a period of some hours. They were then centrifuged and the clear fluid was injected intradermally into adult tuberculous patients. From the difference in size of the resulting "wheals" compared with those produced by similar quantities of non-adsorbed tuberculin it was evident that the tuberculin lost a considerable degree of potency after exposure to the coal dust. In slightly alkaline solutions adsorption was considerably increased, for the treated tuberculin failed to produce wheals in 20 cases, whereas positive reactions were obtained in 18 out of 20 controls.

The question then arose whether the adsorptive power of coal dust in the lungs is the same as in the in vitro conditions, or whether exposure to the body fluids diminishes it. Coal dust was therefore suspended in fresh human blood-serum for 3½ hours. It was then centrifuged, thoroughly washed, and resuspended in the alkaline solution and used for inactivation experiments. Tuberculin adsorbed by this serum-treated coal appeared to be somewhat less active than the untreated material, but the results are nothing like as clean-cut as in the earlier experiments. It is, of course, a big assumption to suggest that the reactions occurring in these experiments are comparable with those actually taking place in the infected lung, and that carbon in the tissues will inactivate the products of the tubercle bacillus as easily as it does in the test-tube. In what must after all be regarded as a crude attempt to imitate the state of coal when actually in the lung, the authors have shown that the dust loses a great part of its absorbing power. It may well be that in the tissues it loses it altogether. As the authors say, the question can only be answered by experiments on the anthracotic animal, and in the meantime we are left with the paradox of the non-tuberculous silicotic coal-miner.

[1] Cummins, S. Lyle, and Weatherall, C.: Adsorption of Tuberculin by Coal Dust, Journal of Hygiene, 1931, xxxi., 464.

ACCIDENTS AND SICKNESS.

APPRECIATION of this interaction between environment and living beings is changing the outlook of accident prevention from the old-time concentration upon mechanical guards towards a regard for the human factor with its special sense reactions. These vary with ill-being and well-being, with the irritation bred of fatigue and the joy of healthy activity. The engineer is coming to see that accidents, far from being merely mechanical mischances, represent pathological reactions to environment; while their study is more and more laying bare to most physicians that the origin of other great causes of pathological occurrences lies as much in the environment of life as in the innate make-up of their patients. The study of "accidental occurrences" has as much to teach the physician as the engineer. The last issue of the Industrial Safety Survey,[1] published bimonthly by the International Labour Office, contains an account of the International Congress held last May at the Industrial Safety Museum in London. At this

[1] Industrial Safety Survey, vol. vii., November–December, 1931. International Labour Office, Geneva.

congress experts met to discuss how best to present the principles of industrial health and the methods for securing it, including the study of fatigue and its prevention, the influence of heat, of humidity, and of noise, and accidents caused by falls. Among official reports quoted upon work done and recent progress attained much space is deservedly devoted to the activities of the British factory inspectors. One notable article of special interest is entitled "Forty years of the Riving Knife," which knife is used with circular saws. The reader of this survey must be impressed with the more or less extensive campaign now conducted against factory accidents, as contrasted with the lack of attention paid to the personal factor in mining accidents, which are at least ten times as frequent; in accidents to seamen; in accidents occurring in quarries, in ship-building, in construction work, or among railway men. All of these have far higher rates and provide objectives urgently calling for more intensive attack.

INTELLIGENCE AND DISEASE.

DOES illness *in general* retard intellectual development or is it only certain diseases that have this effect, and what are they? Answers to these questions are sought in a report by Dr. Shepherd Dawson and Mr. J. C. M. Conn issued this week.[1] Binet intelligence tests, of which a short but admirable account is given, were applied to over a thousand children in the Royal Hospital for Sick Children, Glasgow. These children were drawn mainly from the lower end of the social scale and, judging by housing, occupation of parents, intelligence, or stature, they were below the general Glasgow average. It might be objected that a sick child is not a suitable subject for mental examination. This the authors do not believe, except, of course, when the patient is dangerously ill or delirious. The figures they produce certainly support them, for in intelligent quotient (or ratio, as the authors prefer to call it) the patients did not differ significantly from their healthy brothers and sisters. A comparison of the results obtained in acute, not-acute, and chronic patients, both among themselves and between them and their healthy brothers and sisters, with the results of tests made during and after illness, gives rise to the conclusion that, in general, sickness does not appear to retard mental development. In the acute stages of illness there is even a slight improvement in mental efficiency which, the authors suggest, may be due to a temporary increase in irritability of the central nervous system. There is no indication that chronic illness seriously retards the development of intelligence, as measured by these tests. On the other hand, although disease in general does not appear to produce any distinct effect on intelligence, there are some diseases in which changes can be clearly recognised. These were found to be mainly diseases of the ductless glands and of the brain. There was clear evidence of intellectual deterioration in most of the cases of post-encephalitis lethargica, though no statistically significant difference between those patients with the parkinsonian syndrome and those without it was apparent. The epileptic patients were on the whole of lower intelligence and when re-tested showed signs of deterioration. Eighteen cases of hysteria show a mean intelligence ratio only slightly below the average of the whole of the patients, while, contrary to beliefs sometimes advanced, there is no evidence that children suffering from chorea are drawn from the more intelligent—the "highly strung, excitable, nervous, bright, intelligent" type. There were 105 children with chorea and they proved to be neither brighter nor duller than the rest.

It has long been known that members of the upper social classes are on the whole taller than those of the lower classes. Even in the comparatively homogeneous social class here investigated this tendency is to be observed. When children of the same age are considered there is a tendency for the taller to be the more intelligent. This correlation, as the authors point out, raises some interesting questions. Are we to infer that superior intelligence is inherited with superior stature by certain stocks, or that superior stature in some way promotes the growth of superior intelligence, or that the more intelligent parents make better provision for the bodily growth of their children and that the cumulative effect of this is an increase in stature? It should be possible to test the last question by the examination of, say, a group of public school boys, where the "provision for bodily growth" would not differ appreciably.

[1] Intelligence and Disease. By Shepherd Dawson, M.A., D.Sc., assisted by J. C. M. Conn, M.A., 1931, M.R.C. Special Report Series No. 162. H.M. Stat. Office. Pp. 53. 1s.

SUPRARENAL CORTEX IN ADDISON'S DISEASE.

THE paper from University College Hospital published on p. 125 of this issue will be valuable to all in this country who may wish to try treatment of Addison's disease with suprarenal cortex. It is now nearly two years since W. W. Swingle and J. J. Pfiffner announced their success in preparing an extract which would keep cats alive indefinitely when the suprarenal glands were removed, and the latest report from them and their co-workers[1] summarises the immediate results obtained in a total of 20 human cases. In cats the dosage was 1 c.cm. of extract per day per kg. body-weight, and a corresponding dose in man would be 60–90 c.cm. This could not be provided from the limited supplies available for clinical use, but it must be remembered that in Addison's disease complete suprarenal insufficiency is probably rare and substitution therapy has only to make up the difference between the output of the patient's own glands and his daily requirement. The largest single dose which has been given is 20 c.cm. intravenously, but 40 c.cm. has been given in one day in a crisis of the disease with no untoward effects. For those patients who are so ill as to require continuous treatment 3 to 10 c.cm. has been the amount given daily. The immediate results are constant and striking. Improvement usually appears in 24–72 hours, and the maximal effect, as a rule, is noted "over a period of from five to seven days after stopping treatment." Anorexia, nausea, vomiting, and the distressing pain in the loins disappear and there is early increase in strength and endurance, while decrease in pigmentation becomes apparent within three or four days. Other benefits noted are reappearance of appetite, gain in weight, return of normal gastro-intestinal activity, and a sense of well-being. When the patient is in a state of crisis or shock at the beginning of treatment there is a moderate increase of blood pressure, but little change occurs when the initial condition is good. The results in the 20 cases may be summarised as follows: one case did not respond at all well to adequate treatment and died; two were moribund and died before

[1] Rowntree, L. G., Greene, C. H., Ball, R. G., Swingle, W.W., and Pfiffner, J. J.: Jour. Amer. Med. Assoc., 1931, xcvii., 1446.

adequate treatment could be given; five showed a partial response at the clinic but have required almost continuous treatment with cortical hormone since discharge; three showed an excellent response at the clinic but did not continue treatment at home and died in crisis; nine did well at the clinic and have remained well since, with occasional courses of treatment. The course of the disease is necessarily influenced by the degree of the suprarenal damage, but it is clearly established that the preparation is useful, and it is satisfactory to know that efforts are being made to prepare an active standardised preparation on a commercial scale. Meanwhile it may be noted that S. W. Britton and his associates [2] at the University of Virginia, have found that in animals whose suprarenal glands have been removed the extract is effective when given by mouth in three to five times the intraperitoneal dosage. He thinks that with improved methods of preparation it is possible that oral treatment may be of distinct service, and he predicts that suprarenal cortex will soon find wide application in the medical field.

POLIOMYELITIS IN THE UNITED STATES.

THE serious epidemic of poliomyelitis in the United States of America last year is reviewed in the November issue of the Statistical Bulletin of the Metropolitan Life Insurance Company. Up to Oct. 17th a total of 13,091 cases had been registered in 19 States—a sickness-rate of 21 per hundred thousand of population. The highest rates were in Connecticut State 78·9, and Brooklyn City 94·5. It is interesting to compare this epidemic with that of 1916, when the total sickness-rate was 53·3, Brooklyn City again leading with 224 per hundred thousand. The disease last year was therefore much less extensive than in 1916, and it was also much less virulent, the case-mortality being 10·3 per cent. as compared with 26·2. The death-rate among children was no less than 81 per cent. lower than that of 1916, and the incidence of crippling also was much less. A chart in the report shows the death-rate that might have been expected last year if calculated on the basis of policy-holders affected in 1916. The discrepancy between this curve and that of the actual death-rate is striking, but the two curves show a certain similarity in the way they rise from month to month. A careful comparative epidemiological study of these two outbreaks might provide valuable data.

BARBITURATES AS ANALGESICS IN LABOUR

THE latest candidates for use as analgesics in labour are the barbiturates, and the latest method of employing one of them, nembutal, is described by Dr. J. V. O'Sullivan and Dr. W. W. Craner on p. 119 of this issue. In the scheme they recommend barbiturate is combined with chloral, both drugs being given by mouth, and it is of course a great advantage if the desired effect can be achieved by simple oral administration. Intravenous injection is bound to carry some added risk, though this may be very slight, and instances of thrombosis have been reported. Intravenous injection, moreover, could scarcely be entrusted to the midwife, whereas the authors of this new variation in the use of sedatives for labour think that their method may safely be conducted by her. In this we are not prepared at present to follow them, nor do we hold that the comparatively small number of cases in which the treatment has been tried provides a reliable basis for regarding it as free from all danger. Both the drugs used are potent, and it is plain that scrupulous care is necessary both in dosage and in determining the time for giving the additional doses. Nevertheless the results in the 60 cases on which the paper is based are excellent, and it is quite obvious that this use of nembutal and chloral in combination deserves an extended trial. If further experience substantiates the opinions of O'Sullivan and Craner we shall have an easily administered and very effective method which provides painless labour for a large proportion of cases with no untoward effect on mother or child. A recent paper [1] on pernocton in obstetrics supports the claims which German authorities have made for the use of this barbiturate in labour. Here, however, only the intravenous administration, supplemented by intramuscular injections, is employed, and the procedure comes therefore into rather a different category. Hitherto the chief objection to barbiturates in labour has been the frequency and sometimes the violence of the restlessness which may develop. In only two out of the 60 cases at the London Hospital was this symptom severe after the oral use of nembutal and chloral.

MEDICAL WORK IN BRITISH COLONIES.

THE Bureau of Hygiene and Tropical Diseases have issued, as a supplement to the *Tropical Diseases Bulletin* for December, 1931, a summary of the medical and sanitary reports furnished by British colonies, protectorates, and dependencies for the year 1929. This supplement, which will appear annually, is an innovation. The Colonial Office has hitherto published summaries of these reports, for official use only, under the title of Medical Research in the Colonies, Protectorates, and Mandated Territories. In this form appeared the reports for 1926, 1927, and 1928, edited by Dr. H. H. Scott as secretary of the Colonial Medical Research Committee. This committee no longer exists, and Dr. Scott has joined the staff of the Bureau. The wider publication of these summaries will be to the advantage of all concerned in the administration and growth of tropical medicine. Especially important matters of research are dealt with more fully in the *Tropical Diseases Bulletin* or the *Bulletin of Hygiene*. The supplement consists of a true record of hard routine work performed and a statement of the directions in which research is being carried out. Little attempt is made at comment, but the reader with knowledge and insight will grasp the continuous creative effort underlying these apparently dissociated accounts. For him this unassuming pamphlet describes one of the great endeavours of the human race. It is a pity that an account of public health work in the Anglo-Egyptian Sudan is not included for the sake of completeness, despite the fact that the Sudan does not fall politically within the scope of the collection.

WE regret to learn of the death on Wednesday last of Dr. James Calvert, consulting physician to St. Bartholomew's Hospital.

[1] Med. Jour. Australia, Nov. 21st, 1931, p. 650.

[2] Britton, S. W., Flippin, J. C., and Silvette, H.: Amer. Jour. Physiol., December, 1931, p. 44; Quoted in Jour. Amer. Med. Assoc., Jan. 2nd, p. 52.

A HOSPITAL COLLECTORS' CLUB.—The Manchester Jewish Hospital has a club of young collectors of both sexes with a membership of 300 who, from first to last, have brought in some £12,000.

SPECIAL ARTICLES

CIRCUMCISION AND PENILE CANCER.

BY ABR. L. WOLBARST, M.D.,
OF NEW YORK.

COMMENTING editorially on a previous contribution [1] to this subject, THE LANCET said [2]:

"If Dr. Wolbarst is right in his conclusion as to the comparative freedom [from penile cancer] of the circumcised, his argument for universal circumcision is a strong one. If, on the other hand, he is misinformed about the rarity of penile cancer in Jews and Mohammedans it should be easy to prove him in error."

The main purpose of the present contribution is to clear up the doubt expressed in this editorial regarding the efficacy of circumcision in infancy as a prophylaxis against penile cancer.

Incidentally, the present study has provided the opportunity of arriving at a reasonably accurate estimate of the rate of incidence of penile cancer, as compared with cancer in men generally.

I confidently believe that the data herewith presented fully justify the following conclusions:

1. Cancer of the penis does not occur in Jews circumcised in infancy. There is no authentic case on record. It has occurred in an uncircumcised Jew.

2. Penile cancer does occur rarely in Muhammedans who practise ritual circumcision between the fourth and ninth year, but not in infancy. A few cases have been recorded.

3. Penile cancer occurs almost exclusively in the uncircumcised, particularly in those with phimosis, and occasionally in men circumcised in adult life.

4. There is no racial immunity against penile cancer in Jews or Muhammedans. The one common factor which induces immunity is circumcision in early life.

5. Penile cancer constitutes at least 2 per cent. and possibly 3 per cent. of all cancer in men.

6. The annual mortality from penile cancer in the United States is about 225, all—or at least most—of which can be prevented by circumcision in early life.

The data upon which these conclusions are based were obtained through: (*a*) a questionnaire, (*b*) the medical literature, and (*c*) personal correspondence.* The questionnaire was regarded as the most effective method of obtaining the American morbidity-rate of penile cancer and its relation to circumcision, by interrogating a large number of hospitals throughout the country. From their replies it was hoped to obtain the morbidity-rate of penile cancer (for the period 1925–1930) as compared with cancer in men generally, and the rate of incidence, if any, in Jews, as bearing on the question of prophylaxis by circumcision in infancy. The questionnaire was sent to all skin and cancer hospitals, to all Jewish hospitals, and to 1250 of the largest general hospitals in the United States and Insular Possessions.† Replies were received from 421 hospitals representing every State in the Union,‡ as follows:

(*a*) 15 "general" hospitals reported that they do not accept cancer cases;

(*b*) 28 hospitals in 19 States reported no cancer cases of any kind in men;

(*c*) 43 hospitals in 21 States could not answer any of the questions submitted because of the manner in which their records are kept;

(*d*) 38 hospitals in 20 States reported no penile cancer cases, but could not report their total number of cancer cases in men;

(*e*) 92 hospitals in 31 States, with a daily average of 13,898 patients, reported 4607 cases of cancer in men without a single case of penile cancer;

(*f*) 26 Jewish hospitals in 11 States, with a daily average of 4751 patients, 73 per cent. Jewish, reported seven cases of penile cancer, all in non-Jews. Fifteen of these institutions reported a total of 2166 cancer cases in men, while the remaining 11, including some of the largest and most prominent, were unable to furnish this information because of the manner in which their records are kept;

(*g*) 33 hospitals in 23 States, with a daily average of 8053 patients, 5·5 per cent. Jewish, reported 120 penile cancers, all in non-Jews. They were unable to report their total number of male cancer cases because of their records system;

(*h*) 146 hospitals in 37 States, with a daily average of 32,656 patients, 3·4 per cent. Jewish, reported 710 penile cancers, all in non-Jews, in a total of 43,849 male cancer cases—a penile cancer-rate of 1·62 per cent. in men.

Adding together the number of penile cancer cases in groups (*g*) and (*h*) we have a total of 830 cases of penile cancer, all in non-Jews, reported by 179 hospitals in 44 States, having a daily average of 40,709 patients, of which 4·4 per cent. are Jewish. To the above must be added seven cases of penile cancer (also in non-Jews) reported by 26 Jewish hospitals, in which 73 per cent. of the patients are Jewish.

The grand total of penile cancer cases, therefore, is 837, reported by 205 hospitals in almost every State of the Union, for the years 1925–1930.

It is of more than passing interest to note that one case of penile cancer in a Jew was reported by a mid-West hospital, but this man had not been circumcised. This lends emphasis to the conclusion that the immunity of Jews to penile cancer is not racial, but is due solely to the crucial fact that circumcision eliminates the major factor in the development of penile cancer—namely, the prepuce. These data are fully supported by a survey of the literature on the subject. A few instances will suffice. In 1907, Barney [3] reported 100 cases of penile cancer, all in non-Jews. More recently, Dean [4] reported 75 cases, Schreiner [5] 60 cases, Shivers [6] 5 cases, and Howze [7] 17 cases, all in non-Jews. To these may be added nine cases seen by myself (not published) also in non-Jews. In all of these reports emphasis is laid on the presence of phimosis as the predominant predisposing cause. Howze furthermore urges circumcision at an early age as a prophylactic measure. A review of these data reveals the striking fact that not a single case of penile cancer in a circumcised Jew has been reported in a total of 1103 cases in the United States, despite the fact that Jews constitute about 3 per cent. of the American population.

Sorsby [8] has shown that the incidence of cancer generally in Jews does not differ from that of non-Jews. In England and Wales, he says, the mortality from penile cancer constitutes nearly 0·7 per cent. of all male cancer deaths, and in Vienna about 0·4 per cent. Nevertheless, Sorsby was unable to find a single case of penile cancer recorded in 2252 male cancer deaths investigated among the Jews of London and Vienna. Furthermore, in an extensive study of 40 cases of penile cancer made by Foderl [10] in 1926, none of the patients was a Jew, and in the principal Jewish hospital in Vienna there had been no operation for penile cancer in 11 years.

A similar observation is made by F. L. Hoffman,§ who made a special study of cancer among the Jews

* My thanks are particularly due to Dr. F. L. Hoffman, consulting statistician of the Prudential Life Insurance Co., and to Dr. Joseph Muir, medical director of the Radium Emanation Corporation, for their valuable contributions of statistical data.

† Only those "general hospitals" having 100 beds or more, as rated by the hospital number of the Journal of the American Medical Association, were addressed.

‡ As a matter of convenience, Alaska, the Philippines, Canal Zone, Hawaii, and Porto Rico are tabulated as individual States.

§ Personal communication, April 13th, 1931.

in Montreal. Out of several thousand deaths, there was not a single case of penile cancer in a Jew. In the large Jewish community of Palestine, Dr. H. Yassky, Acting Director of the Hadassah Medical Organisation, reported || that not a single case of penile cancer was recorded in a Jew in a total of 42,321 new cases in the Skin and Venereal Clinic; one case, however, was reported in a Christian Arab.

From these data it is evident that, while penile cancer may occur in an uncircumcised Jew, it does not occur in Jews circumcised in infancy. The latter observation has been made by competent observers, among whom may be mentioned the following: H. J. Waring,[9] Da Costa,[10] Chetwood,[11] Watson and Cunningham,[12] Lowsley and Kirwin,[13] Thomson Walker,[14] Morton,[15] Eisendrath and Rolnick,[16] Legueu and Michon,[39] and K. M. Walker.[41]

PENILE CANCER IN MUHAMMEDANS.

A high degree of immunity against penile cancer is also seen in Muhammedans, who, like the Jews, practice ritual circumcision. In India, Sutherland [17] reported 792 cancer cases, of which 72 were penile, all occurring in Hindus (uncircumcised) and none in Muhammedans: while in a series of 64 cases seen in Calcutta, and reported by Megaw [18] only two occurred in Muhammedans.

Through personal correspondence I have been fortunate enough to obtain most valuable data concerning penile cancer in Indian hospitals during the period 1925–1930. The figures are clearly shown in the accompanying Table:—

Hospitals.	Total cancers in men.	Penile cancers.	Penile cancers in—		Percentage of Muhammedans in hospitals.
			Hindus.	Muhammedans.	
Madras Presidency (*a*) and Madras City ..	5122	921	907	14	9·8
Government of Bengal (*b*)..	1792	117	109	4	16·0
Civil hospitals, Central Provinces (*c*) ..	460	113	109	2	21·8
Civil hospitals, Assam (*d*) ..	318	49	44	4	37·13
Totals ..	7692	1200	1169	24	Average 21·19

(*a*) Personal communication, Surgeon-General's Office, Oct. 22nd, 1931.
(*b*) Personal communication, Surgeon-General's Office, July 23rd, 1931.
(*c*) Personal communication, Inspector-General's Office, June 30th, 1931.
(*d*) Personal communication, Inspector-General's Office, Sept. 18th, 1931.

If we combine these official figures with those of Sutherland and Megaw, we have a total of 8484 cancers in men. Of these, 1336 were penile cancers, of which 1303 occurred in Hindus (97·5 per cent.) and 26 in Muhammedans (2 per cent.), despite the fact that the average Muhammedan population in the hospitals reporting was 21·19 per cent. It is obvious that if penile cancer occurred with equal frequency in both these races, the number of cases reported in Muhammedans ought to approximate 254, instead of the 24 cases actually reported. (It may be noted, in passing, that the morbidity-rate for penile cancer in these Indian hospitals was 15·6 per cent., as compared with a rate of 2 to 3 per cent. in Europe and the United States. Vide infra.)

Sampoerno [19] investigated this subject among the Muhammedans of East Java, who also practice ritual circumcision. In a total of 78 cases of penile cancer, he reported seven in Javanese (presumably Muhammedans), three in Chinese, and one in a European, but he does not state definitely that the Javanese had been circumcised. It is possible, of course, as Kennaway points out,[20] that there may be a greater liability to penile cancer in Javanese than in other Muhammedan groups. As an instance of such racial peculiarity, Sampoerno asserts that cancer and ulcer of the stomach never occur among the Javanese.

Assuming that these seven Javanese were circumcised, we find that in the 1414 cases of penile cancer reported by these official and individual observers, only 33 (2·4 per cent.) occurred in circumcised men, as against 1374 (97·2 per cent.) in uncircumcised men living in the same communities. To these figures, if we add 1103 penile cancers reported in the United States, we have a grand total of 2484 penile cancers reported in uncircumcised men (Americans, Indians, and Javanese), as against 33 cases reported in circumcised men, all Muhammedans. Not a single case is reported in a circumcised Jew.

It is of some interest to inquire into the possible reason for the occurrence of penile cancer in Muhammedans, even to the slight extent of 2·4 per cent., as compared with the total immunity which characterises the Jews. The reason, I believe, is to be found in the fact that while ritual circumcision in Jews is performed on the eighth day of life, the Muhammedans perform their rite much later—between the fourth and ninth years. It is conceivable that in the presence of a foreskin, particularly if unretractible, there may occur the added chemical irritation due to retained secretions and the mechanical effects of dried smegma constantly eroding the delicate mucous surfaces. These irritating factors, acting for a period of four to nine years, may well be sufficient so to modify the character of the affected tissues as to constitute the necessary foundation for the later development of cancer, even though the offending prepuce had been removed at some time during youth.

This hypothesis is seemingly supported by recent reports in medical literature. R. O. Stein [21] discussing the occurrence of cancer on the inner surface of the prepuce in boys and young men with congenital phimosis, concluded that the malignancy arises from chronic irritation of the balanitic condition set up by the phimosis and that the precancerous stage can be recognised in the leukoplakic lesions usually observed in these cases. In three cases of penile cancer examined pathologically by Dormanns [22] in China, the men were 24, 26, and 34 years old respectively, and in all of them the cancer had developed on a greatly inflamed surface. Chavannaz and Magendie [23] report a case of a man of 31, treated in June, 1926, for phimosis and balanitis, who returned nine months later with an ulcerating cancer. One may safely surmise that while it is possible that the cancer in this case might have been prevented if circumcision had been done when the "balanitis" was under treatment, it is even more probable that the precancerous condition had already existed for some time and was erroneously diagnosed as "balanitis."

Further, it is generally known that penile cancer occasionally develops in men who were circumcised in adult life.‡‡ "Many years may elapse," says Muhlpfordt [24] "before the precancerous condition

|| Personal communication, June 2nd, 1931.

‡‡ In three of the series of 837 cases which I have collected, cancer had developed in men who had been circumcised in maturity. Inquiries made to determine when and why the operation had been performed failed to elicit this information.

passes over into a clinically and histologically recognisable malignant tumour." In 3 per cent. of Dean's cases,[4] leukoplakia unquestionably preceded the cancer, but all of these patients had been circumcised in adult life, "probably for sufficient cause." It is reasonable to assume that the leukoplakia, admittedly present, was the most probable cause. In Schreiner's series of 60 cases,[5] eight gave a history of circumcision before the beginning of the disease, and in one case the epithelioma appeared one year after the circumcision. He does not state why the operation was performed, but there is usually a good reason. Lloyd Lewis,[37] in a report of 70 cases of epithelioma of the penis (Brady Urologic Clinic, Johns Hopkins Hospital),§§ referring to several cases in his series, says, "it is entirely possible that both of these patients had early malignancy at the time of their circumcision."

In these and other cases with a similar history the explanation is probably the same. The foundation for the cancer was laid during the years of irritation provoked by the abnormal conditions within the preputial cavity, and the fundamental trauma of the tissues had already been permanently effected when the circumcision was done. The fact that the circumcision scar is often the seat of the cancer lends further support to this view, inasmuch as cancer does not occur in the scar of Jews circumcised in infancy and but rarely in Muhammedans.

The conclusion is inescapable that the irritation in the preputial cavity may begin in early life and that the tissue damage thus produced may persist as a foundation for cancer long after circumcision has been performed. All of which gives point to the conclusion that the earlier in life circumcision is done the less danger there is of the development of cancer in later life. The maximum degree of protection is provided by circumcision in infancy, as exemplified in the 100 per cent. immunity enjoyed by the Jewish race. In other words, where there is no foreskin there will probably be no cancer.

That this immunity is not racial, as Young [25] and others believe, is made evident by the occurrence of penile cancer in the case of the uncircumcised Jew already referred to, and by the almost complete immunity enjoyed by Muhammedans of non-Semitic origin. Commenting on this aspect of the subject, Sorsby [8] emphasises the fact that the Indian Muhammedans are not allied to the Jews racially, as the Arabians are, and that the one common factor shared by Jews and Muhammedans in this respect is the "habit of circumcision." In short, penile cancer is absent, not in races, but in those communities in which circumcision is practised as a ritual. It is the absence of a prepuce from the earliest days of life that provides the immunity against cancer.

MORBIDITY-RATE OF PENILE CANCER.

We have seen that the questionnaire elicited complete responses from 146 hospitals, in 37 States, having a daily average of 32,656 patients. These institutions reported a total of 43,849 cancers in men, of which 710 were penile—a rate of 1·62 per cent. But this cannot be accepted as the final morbidity-rate for penile cancer; other factors must be taken into consideration. First is the fact that cancer is not a notifiable disease, and it is quite certain that a considerable number of penile cancers, not fatal and therefore not in the vital statistics, are "covered up" for social and family reasons and thus remain unrecorded. Again, all penile cancer cases do not go to hospitals for treatment. Many cases are successfully treated by irradiation and X rays at doctors' offices and out-patient clinics. Then there are the cases in which the growth remains undiscovered for many months, death occurring because of some accident or intercurrent disease. E. Langer [26] reported the case of a man of 68 who had phimosis. On making a dorsal incision, he found a flat ulcerating squamous-called carcinoma under the foreskin. There must be many such cases; I have encountered two myself. In one, the man had been treated during nine months for balanitis, and the epithelioma was discovered only when the prepuce was slit open; in the other case, five months had elapsed before the diagnosis was made by dorsal incision.

In view of these circumstances, taking as a basis the 1·62 percentage in the 146 hospitals referred to, it is a conservative estimate that the morbidity-rate of penile cancer is at least 2 per cent. and possibly 3 per cent. of all cancers in men. This estimate is approximately one-half that of the famous surgeons, Winiwarter,[27] 2·55 per cent., and Billroth,[28] 3·10 per cent., of all cancers in both sexes. Englisch,[42] in an extensive study of the literature, concluded that the morbidity-rate of penile cancer was 1·78 per cent., as compared with cancer in men generally, and 2·32 per cent., compared with cancer in both sexes.

MORTALITY-RATE.

While this paper is not concerned with the mortality-rate, it is pertinent to consider it briefly as an indication of the seriousness of penile cancer as a cause of death and its relative frequency in various localities. According to the United States Census Bureau, there were 144,206 deaths in the United States from cancer in males in 1927, 1928, and 1929. Of these, 654 were penile, a rate of 0·45 per cent. In England and Wales [29] in the same period the rate was 0·61 per cent. In the hospitals of the U.S. Veterans' Bureau, P. B. Matz [36] reported three deaths from penile cancer in the fiscal years 1923–25. Of these, two were in the age-group 30–39 and one in the age-group 40–49. The total number of deaths from malignant tumours in these groups was 124, which makes the mortality-rate for penile cancer 2·4 per cent. In Colombo (Ceylon) penile cancer is extraordinarily common. Spittel,[30] one of three surgeons in the General Hospital, operated on 91 cases in four years. He says: "The specific irritant seems to be the pent-up smegma, caked and disintegrated; for congenital phimosis is the almost invariable accompaniment." He adds, significantly, that "carcinoma of the penis is never seen in Moors who practice circumcision." Maxwell,[31] discussing penile cancer in China, reports that in a total of 558 cases of cancer there were 88 cancers of the penis (15·8 per cent.). In Chinese tin-miners, de Vogel [32] reported five penile cancers in a total of 48 cancers in men (10 per cent.). In 1929, in the Federated Malay States,[33] out of 69 cases which came to autopsy, eight were penile cancers (12 per cent.).

Lieut. Commander R. P. Parsons, of the U.S. Navy, reporting on conditions in Haiti, says:—‖‖

"Although there are no statistics on hand, I can state with certainty that cancer of the penis in Haiti is extremely common—more so than anywhere else I've been, and this in spite of the fact that cancer in general in Haiti is somewhat less common than in countries in the Temperate Zone. This fact I attribute to the almost complete lack of circumcision in Haiti. It is practically unknown there. Also, the very low state of personal hygiene, either in knowledge or in practice. Bathing is common enough, but few boys or men would think of cleansing the mucous surface of the prepuce."

§§ These cases are included in the series of 837 cases which have collected.

‖‖ Personal communication, Oct. 22nd, 1931.

From these data it is fair to infer that there is a direct relationship between the lack of hygienic care of the male genitals and the occurrence of penile cancer, and that it is most common among peoples in whom ignorance and poverty combine to maintain genital hygiene at its lowest standards.

It is a curious fact that while all students of penile cancer recognise the ætiological importance of phimosis and uncleanliness and recommend circumcision only as a means of relief for the phimotic condition, most of them fail to recognise in early circumcision a perfect prophylactic agent against phimosis and its possible sequelæ. This attitude is based on the fallacy that retractibility of the prepuce protects against the accumulation of pathogenic products in the preputial cavity, and therefore eliminates the foreskin as a potential factor in the causation of penile cancer. Lewis,[37] however, states that 19 of his cases had retractible foreskins without a history of phimosis, five had acquired phimosis during the growth of the tumour, and only nine gave a history of long non-retractible foreskin; and he properly concludes that the retractibility of the prepuce "is not insurance against retention of the smegma."

It must be obvious to all who care to see that these conditions, arising basically in the unclean preputial cavity, can be prevented by the simple medium of circumcision in infancy, to say nothing of the many other hygienic advantages of this procedure. Why wait until "balanitis" with its cancerous potentialities has supervened? It is a gratifying sign that the practice of non-Jewish parents of having their male children circumcised early in life is rapidly growing in the United States, despite the myopic opposition of medical men who persist in regarding the foreskin as something holy and sacred. The active head of the most important anti-cancer organisation in this country writes me, "I don't think you have to plead cancer prophylaxis in justifying circumcision. Most of the children of my friends are circumcised early for general hygienic reasons." Circumcision of all male infants is therefore urged as a general hygienic measure and particularly, in this connexion, as an almost certain preventive measure against the later development of penile cancer.

SUMMARY.

(1) The morbidity-rate of penile cancer in the United States is at least 2 per cent. and possibly 3 per cent. of all cancer in the male; it is about 15 per cent. in the Far East. (2) Phimosis is universally recognised as the most important factor in the causation of penile cancer. (3) There is no record of a case of penile cancer in a circumcised Jew. (4) One case of penile cancer is reported (in this paper) in an uncircumcised Jew. (5) Two hundred and five American hospitals and six individual observers report 1103 cases of penile cancer in the United States, all in non-Jews. (6) Twenty-six Jewish hospitals (included in the above) do not report a single case of penile cancer in a Jew. (7) Penile cancer occurs rather rarely (2·4 per cent.) in Muhammedans; in India and Java, 33 cases of penile cancer were reported in (circumcised) Muhammedans, as against 1381 in uncircumcised men living in the same communities. If we add 1103 penile cancers reported in the United States, we have a grand total of 2484 penile cancers reported in uncircumcised men (Americans, Indians, and Javanese), and 33 in circumcised men, all Muhammedans. Not a single case is reported occurring in a circumcised Jew. (8) There is no racial immunity against penile cancer in Jews and Muhammedans. The immunity is provided by the practice of circumcision in early life. (9) Leukoplakic conditions leading eventually to cancer may be observed in boys and young men. Years may elapse before the conditions are recognised as frankly malignant. (10) Circumcision in adult life or adolescence does not protect fully against future malignancy because of the tissue damage already effected. (11) "Chronic balanitis" in the middle-aged or elderly should always be regarded as potentially malignant. (12) At least 225 deaths annually in the United States, and 150 in England and Wales, and probably twice as many non-fatal cases can be prevented by the circumcision of all male children in infancy.

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SWINDON ISOLATION HOSPITAL.—The mayor of Swindon, Alderman J. L. Calderwood, last week opened a new administrative block at this hospital, providing 33 bedrooms and 15 bathrooms.

OTLEY DERBY CLUB.—It is proposed to continue and extend the operations of this club, which was formed in the early part of last year. The annual subscription was fixed at 10s.; it was provided that 20 per cent. of the receipts should be given to hospitals, and that the remainder of the money would be given in prizes upon the result of the Derby. The membership reached nearly 45,000 and £4500 was distributed among British Hospitals. The first prize-winner in the Derby event received £5000, the second £2500, and the third £1000. The balance was devoted to the purchase of the club premises and the cost of maintenance.

MEDICINE AND THE LAW.

Escape of Child from Institution.

ACTS of Parliament are ineffective if they march ahead of public opinion. In particular, measures of social reform which involve official interference with family life encounter a resistance from parents which magisterial authority (reflecting public opinion in some degree) seems disinclined to quell. Prosecutions under Section 12 of the Children Act, where a parent refuses to allow a child to undergo some necessary and proper surgical operation, are not unfamiliar; the magistrates realise that the parents' feelings are natural if mistaken and, as a rule, they explore any expedient sooner than impose a penalty. A similar tendency appears in recent proceedings under Section 53 of the Mental Deficiency Act against a mother for assisting her daughter to escape from an institution. There was a summons also against the father for secreting his daughter. For the London County Council it was explained that the child had attended various mental deficiency schools and in April last was recommended for treatment at an institution in Hampshire. Last September she was allowed out with her mother on the understanding that she would return the same evening. She did not return and eventually was found at her parents' house in Islington. The father told the local authority's officer that the girl was in a good situation and had a good home. He refused information and invited prosecution; "I will go to prison," he said, "it is a shame she is not to be allowed out." When the case came before the Clerkenwell police-court, the magistrate invited the legal representatives on both sides to confer. As a result the L.C.C. representative said that, if the child was allowed to go back to the Hampshire home, he would do all in his power to facilitate action by the parents to have the order set aside; the parents' representative assented to this compromise. The metropolitan police-court bench is to-day unusually rich in able and experienced magistrates. They use their discretion to the great advantage of us all. But such reluctance to enforce the law teaches the social reformer the lesson that there are limits to what can be achieved by mere Act of Parliament.

Dangerous Drugs Act: Charge against Medical Attendant.

George Edward Williams, described as a medical attendant, was charged at Marlborough-street police-court a fortnight ago with being in unauthorised possession of morphine sulphate and cocaine hydrochloride contrary to the Dangerous Drugs (Consolidation) Regulations of 1928. A representative of the Director of Public Prosecutions outlined the case against him. It was alleged that Williams was acquainted with a Dr. Kirton, who formerly had a surgery at Foley-street, and that, when Dr. Kirton left, Williams took a lease of the premises and practised there as a doctor. Chemists gave evidence that they had supplied drugs to him in the belief that he was a registered medical practitioner. It is alleged that in one case he actually prescribed a dangerous drug.

On remand last week it was stated that a further charge of forgery is likely to be preferred. The case was adjourned pending the completion of inquiries.

THE LÜBECK TRIAL.

(FROM OUR BERLIN CORRESPONDENT.)

(*Continued from p. 102.*)

IT was expected that the hearing of witnesses and of medical experts would end on Jan. 11th, and that after an interval of three days the public prosecutor, counsel for parents, and counsel for the accused medical men and nurse will plead. The verdict will thus probably not be pronounced before Jan. 20th. This long trial will thus finally be closed after a duration of about three months.

In the course of the trial the question was discussed whether the disaster could have been avoided if the physicians had not assumed that the infant G., the first victim, had suffered from congenital tuberculosis. Prof. Schürmann, of Berlin, gave evidence that after the administration of the vaccine swelling of the cervical glands had developed. In congenital tuberculosis an isolated swelling of the cervical glands, without other symptoms, seldom occurred. The infant G., having been the first who showed such symptoms after the administration of the B C G, it would have been better to consider the possibility that the disease had been caused by that administration. If the attending physician had known that in the laboratory the B C G was cultivated together with virulent tubercle bacilli he would certainly have had that suspicion. Unfortunately there was only little collaboration between the physician of the children's hospital, Prof. Klotz, and the head of the laboratory, Prof. Deycke. Prof. Deycke's duty as a bacteriologist would have been to stop the distribution of the tubes as soon as he was informed that an infant had become ill, until he had tested in animals the condition of the emulsions. Prof. Klotz replied that he had reasons to believe that the infant G. suffered from congenital tuberculosis, because the mother was tuberculous. When the glandulars welling extended he had removed a piece of a gland for bacteriological examination, to ascertain whether B C G or human bacilli were present. The examination of the gland had convinced him that the case was one of congenital tuberculosis. He was still of that opinion, because tuberculosis could not be acquired so soon after the administration of the B C G. In fact, the other infants became ill only several weeks afterwards. He had not been informed that in Lübeck not only infants from tuberculous families, but all the new-born children were to be treated with the B C G.

INDUSTRIALISM IN INDIA.

A REPORT FROM BENGAL.

A SAMPLE of Indian industrial conditions is provided by the annual report for 1930 on the administration of the Indian Factories Act in Bengal. The number of registered factories had increased from 1482 to 1555 since the previous year but of these 111 did not work at all, this number including 44 rice mills, 17 oil mills, 14 general engineering workshops, and 11 jute presses. The number of operatives was 441,511, as against 466,741 in the previous year, and even in 1930 there had been changes in the general conditions of workers and their wages as a result of the industrial depression. Many mills had to revert to the single shift, and various modifications were made in the

total weekly and monthly working hours. In the jute mills, for instance, in July, 1929, the working hours were increased from 54 to 60 per week, the longer hours resulting in increased earnings. In July, 1930, they reverted to the 54-hour week, and in addition closed down completely for one week in each month; but compensation was given for the shorter week in the form of an increase in wage rates, and a subsistence allowance was paid during the week of idleness. Some decrease in the average monthly earnings was inevitable, but owing to these measures it was only slight. Considering the circumstances, total emoluments seem to have been maintained surprisingly well.

The architectural features of many considerable factories still leave much to be desired, and, owing to primitive conditions, it is not always possible to enforce the regulations rigidly. One case is quoted where immediate enforcement would have thrown 2000 people out of work, but a remedy was eventually found during a change-over to electric power. The premises of half the registered printing presses are ordinary dwelling-houses, and are not as a rule satisfactorily lighted or ventilated. Trouble arises in such cases from injurious gases, and lead poisoning is a serious problem. Many orders were issued during the year to printing presses, but it is evidently very difficult to get reasonable precautions against lead poisoning carried out. Washing can usually be arranged for, but even in the larger presses food precautions are a difficulty, owing to the impossibility of getting people of different races and castes to eat together. It is a common practice for employees to bring their dinner with them, and keep the food beside them while at work. This difficulty has been met in a large railway press by having three separate mess-rooms for Hindus, Mohammedans, and Anglo-Indians, but it is obviously impossible for the smaller establishments to make such arrangements. The report states that the prevalence of lead poisoning, even in registered printing presses, cannot be denied, while investigation of the appalling conditions in some of the unregistered presses suggests that it must be much more prevalent in them.

The result of a general survey of the housing conditions of the larger factories is distinctly encouraging. In spite of lean years considerable advance is being made in Calcutta, as in Bombay, where a large amount of excellent accommodation is available in great blocks of flats, the chief difficulty being to induce the workers to leave their slum dwellings to inhabit them. But, with the exception of tea factories, in the smaller concerns employees usually have to fend for themselves, usually in mean and congested areas. In tea factories, labour recruited from jungle areas in the north often prefers flimsy bamboo huts, thatched with grass, to more permanent dwellings, one reason being the superstitious custom of firing a hut after a death in it, to drive away evil spirits.

The average number of women employed during the year in registered factories was 73,951, as against 77,966 in 1929, and of children 16,630, as against 23,036. The general tendency in jute mills is to eliminate children, and out of 91 mills 45 have dispensed with child labour entirely, despite the fact that children, on account of their height, are better fitted than adults for the shifting work on spinning frames. Generally speaking, it appears that the conditions of employment of both women and children are improving, and both the Government inspectors and the Society for the Protection of Children are evidently on the alert to discover cases of abuse. Only children of 12 years or more are eligible for employment in factories.

The report is not optimistic about sanitary arrangements. In the larger factories hygienic conditions have made moderate progress, but in the smaller little improvement is manifest. Even where good latrine accommodation is provided it is often abused. In the smaller factories conditions are commonly abominable, and repeated prosecutions seem to have little effect. Some advance is being made in the installation of septic tanks, and the Willas aerobic septic tank is mentioned favourably. One difficulty is the uncleanly habits of the mill hands, who frequently use surface drains for latrine purposes, thus fouling the effluent. Complaint is made of the fouling of the Hooghly river, which furnishes part of the water-supply of Calcutta, in this way. It is suggested that legislation should be provided which would give no option to the intending employer of a certain number of workers but to erect a septic tank latrine.

Ventilation also is the despair of the factory inspector, owing to the unsuitable premises in which many of the smaller firms carry on their work, but special attention is being paid to manufacturing processes in which dust and fumes are generated. A dry-battery factory and an electric steel foundry are cited as instances in which orders were issued for the installation of extractor fans in large establishments, but in the smaller factories the cost of such a system would be prohibitive. It is surprising to read that tea factories are amongst the worst offenders for the generation of dust. The present depression of the industry is an obstacle to progress in the way of fitting efficient trunk systems for the removal of tea fluff.

Apart from a severe epidemic of malaria in the Calcutta area the general health of operatives was normal. Maternity benefit schemes have been very successful, and are greatly appreciated by the workers. An important development which is attributed to the Whitley Commission was the decision of the Indian Jute Mills Association to establish welfare centres, baby clinics, and creches in all mills within their membership.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. H. H. Ormsby is placed on the retd. list.
Surg.-Comdr. C. J. Aveling is placed on the retd. list with the rank of Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. R. H. O. B. Robinson is placed on the retd. list at his own request.

ROYAL ARMY MEDICAL CORPS.

Maj. (temp. Lt.-Col.) J. C. L. Hingston to be Lt.-Col.
Maj. A. E. B. Jones to be temp. Lt.-Col.
Capt. F. V. Cant relinquishes his temp. commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Lt. E. T. Colville, from Active List, to be Lt.

INDIAN MEDICAL SERVICE.

Lt.-Col. L. Cook to be Col.

ROYAL AIR FORCE.

Group Capt. H. Cooper, Honorary Surgeon to The King, is placed on the retd. list.

COLONIAL SERVICE.

Dr. N. J. Abbensetts has been appointed M.O., Boundary Commission, British Guiana; Dr. L. R. Levy, M.O., Jamaica; and Dr. D. C. Ogilvie, M.O., Leeward Islands.

PANEL AND CONTRACT PRACTICE

Health Insurance Certification: Complaints of Misleading Statements.

THE East Sussex Insurance Committee has had occasion to complain of misleading certificates being issued by three practitioners. After examination of the circumstances and after taking into account the doctor's explanations, the committee has recommended the Minister of Health to withhold the sums of ten, five, and seven guineas respectively from the remuneration payable.

In the first of the three cases the patient was an elderly woman suffering from advanced rheumatoid arthritis and unable to move about her room unaided. In a series of monthly certificates, giving the cause of incapacity as rheumatoid arthritis, the practitioner stated that he had examined the patient on the dates named. The certificates were dated in Nov. and Dec., 1930, and in the first five months of 1931. Some time after the latest of them the patient signed a statement that the practitioner last called to see her about six months ago. When the question was taken up last June, the practitioner admitted he had not visited or seen her between November, 1930, and June, 1931. Before signing the certificates, however, he had satisfied himself that there was no change in her condition by inquiry of the Queen's Nurses who reported to him weekly. He practised in the town in which the patient lived, and at no great distance from her home. The Medical Service Subcommittee's comment was that the practitioner did not frankly admit his fault but seemed to harbour the idea that his error was merely technical and that he could throw some of the responsibility upon the Queen's Nurses. The subcommittee pointed out that no practitioner can delegate his responsibility for issuing certificates of incapacity; certification is not a mere technical matter nor does it fall within the category of merely clerical work. "It is essential," they observe, "that medical men should realise that certification for National Health Insurance purposes is an essential part of their duty. The obligation to visit once a month a patient who was practically bedridden cannot, in the subcommittee's view, be considered unduly onerous."

The second case was that of a practitioner who gave a monthly certificate in each of the first five months of 1931 for a patient 57 years of age suffering from carcinoma of the stomach. Each certificate stated that the practitioner had examined the patient on the date named; the cause of incapacity was given as "gastric neoplasm" or "abdominal neoplasm." Last June the patient signed a statement that the practitioner had not visited him since the previous December, though passing his door twice a week. The patient was able to go for walks and could easily have visited the surgery. He did not visit the surgery, nor did the doctor visit him, during the period covered by the certificates; but it did appear that the doctor had seen him walking about the village at about the dates of the certificates. The certificates were given to the patient's wife who called at the surgery for them. The patient lived in a small village some miles from the doctor's house; but the doctor had a surgery in the village within fifty yards of the patient's house; the doctor attended this surgery on Thursdays; all the certificates were dated on Thursdays. The subcommittee conceded that the practitioner was under no obligation to call on the patient; it was for the patient to present himself at the surgery. The patient had at times suffered from mental aberration and there was perhaps a doubt of the effect which a visit to the surgery might have had on his mental condition. As already stated, this practitioner did see his patient but not in the professional sense. The subcommittee considered that, while an exhaustive physical examination may not be necessary on every occasion when a certificate is issued, the practitioner must see the patient in a professional capacity, and take proper steps to confirm his expectation, based on previous knowledge, that the patient remains incapable of work.

In the third case it was again the fact that the patient had the obligation to call at the practitioner's surgery rather than that the doctor had to visit the patient. In both the second and third cases the doctor seems to have erred out of good nature, giving certificates to the patient's wife to avoid giving trouble. In the third case the patient was aged 58, and suffered from rupture, piles, epileptic fits at rare intervals and other ailments, definitely making him quite unfit for work; he had been receiving benefit since the beginning of 1927. The practitioner gave him eleven certificates between Oct. 8th, 1930, and the end of July, 1931; the first five indicated the cause of incapacity as "Con. after pneumonia," the last six, "Con. after pneumonia; epilepsy." In each certificate the practitioner stated that he had examined the patient on the date named. Last August the patient signed a statement that it was fifteen months, as far as he could remember, since the doctor came to the house to see him. The patient was quite able to walk to the doctor's place of call in his village but did not do so. At an earlier period the patient had come in person for his certificates; during the time of the eleven certificates he had sent his wife for them; after the question had been raised, the practitioner insisted on the plaintiff coming personally for his certificates.

The subcommittee expressed appreciation of the frankness with which the second and third practitioner admitted carelessness. The period of irregular certification was twice as long in the third case as in the second. Such considerations explain the difference in the sums recommended to be withheld in the three cases. In all three cases there were certain mitigating elements. The subcommittee could draw attention to the fact that in each case there was chronic disease and undoubted incapacity, that monthly certificates were justifiable, that active treatment would have produced little or no relief or improvement and that, in consequence of the foregoing elements in each case, the approved society was not prejudiced by paying out benefit not properly due. It is nevertheless impossible to resist the Insurance Committee's conclusion that the certificates contained false and misleading statements, or to challenge its conclusion that the issue of such certificates deserves grave censure.

BIRMINGHAM HOSPITAL SUNDAY FUND.—At the annual meeting of this fund last week it was stated that since 1859 a total of £403,541 had been collected, an average, after deducting a fraction over 6 per cent. for the expenses of administration, of £4953 a year. The collections in 1931 fell below the figure of the previous year by nearly £500. There has, indeed, been a steady decrease for some years past, which is attributed to the university students' carnival being held on the day before Hospital Sunday.

CORRESPONDENCE

POINTS IN THE NOTIFICATION OF INDUSTRIAL DISEASES.

To the Editor of THE LANCET.

SIR,—Many medical men are, I am afraid, unaware of their statutory obligation to notify certain industrial diseases. I may quote two recent examples in regard to toxic jaundice, one a series of cases due to tetrachlorethane, and the other a series due to arseniuretted hydrogen. Only one of the cases was notified by a medical practitioner. In regard to the series due to arseniuretted hydrogen, notification of the earliest case would have led to the adoption of measures which might, it is anticipated, have prevented the occurrence of subsequent cases, including two deaths. This serious result alone seems to be ample justification for asking you to allow me to draw the attention of the profession to the very important statutory requirement of notification of industrial poisoning under the Factory and Workshop Acts, 1901–1920, and Lead Paint (Protection Against Poisoning) Act, 1926.

Every medical practitioner attending on, or called in to visit, a patient whom he believes to be suffering from any of the following:—

Lead poisoning, Phosphorus poisoning, Arsenical poisoning, Mercurial poisoning, Carbon bisulphide poisoning, Aniline poisoning, Chronic benzene poisoning, Anthrax, Toxic jaundice, Epitheliomatous ulceration or Chrome ulceration,	contracted in any factory or workshop,

is required by Section 73 of the Factory and Workshop Act, 1901, under penalty, to notify the case forthwith to the Chief Inspector of Factories, Home Office, London, S.W.1, and by Section 3 of the Lead Paint (Protection Against Poisoning) Act, 1926, he is also required to notify lead poisoning contracted by any person employed in, or in connexion with, the painting of any building whether or not that building is a factory or workshop, unless it has already been so notified; and he is entitled to a fee of 2*s*. 6*d*. for so doing.

Forms for notification will be supplied on application to the Chief Inspector of Factories, Home Office, London, S.W. 1.—I am, Sir, yours faithfully,

JOHN C. BRIDGE,
H.M. Senior Medical Inspector of Factories.

Factory Department, Home Office, Whitehall, S.W.,
Jan. 11th, 1932.

MULTIPLE PRIMARY CARCINOMA IN THE BUCCAL CAVITY.

To the Editor of THE LANCET.

SIR,—The case recorded by Lord Moynihan in which carcinoma developed at intervals in different parts of the buccal cavity is to some extent paralleled by three cases recently under treatment at the Cancer Hospital, and it may be that added interest attaches, in that radium was used to treat the initial lesion.

In all three cases the patients were elderly males, and the initial lesion "epithelioma" was in the anterior part of the floor of the mouth. In all three cases sound healing occurred without any sign of local recurrence, and there was no connexion clinically between the initial lesion and the growth that followed.

In one case the second growth involved the soft palate and fauces, and was noticed two years after the initial lesion had been treated. In the second case a mass of glands developed a year after treatment, and examination showed an ulcerated area in the pyriform fossa on the same side. In the third case, death from carcinoma of the pharynx and breaking down glands occurred 17 months after treatment to the floor of the mouth.

Every surgeon with experience of excision operations on the tongue will endorse Lord Moynihan's contention as to the rarity of local recurrence thereafter. Attached to the Cancer Hospital for 20 years as surgical registrar and surgeon, I have not met with such a happening. The fallacy instanced is one that has been quoted to me several times recently by candidates for higher surgical qualifications.

Radium for the last few years has to a large extent displaced surgery in the treatment of carcinoma of the tongue, and it may be that this myth as to local recurrence after surgical removal owes its origin and growing currency to those rising radiologists and surgeons whose clinical experience has been confined to this period.

This question of recurrence is surely fundamental if any attempt is to be made to assess the relative value of different methods of treatment, and it is of importance therefore that inaccuracy should be corrected.—I am, Sir, yours faithfully,

PERCIVAL P. COLE.

Wimpole-street, W., Jan. 11th, 1932.

A NEW METHOD OF APPROACH TO THE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

To the Editor of THE LANCET.

SIR,—I fear that Mr. Harry Platt has misinterpreted the purport of my Clinical Note with the above title (THE LANCET, Dec. 26th, 1931). I have made no claim there or elsewhere to be the originator of the "combined anterior and posterior approach to the semilunar cartilage," although I first performed the operation in 1924, before, as far as I am aware, any reference had been made to this method in surgical literature. It certainly appears that to the late Mr. Alwyn Smith is due the credit of first publishing the "combined anterior and posterior approach" (*Journal of Bone and Joint Surgery*, April, 1925). Whatever claim to originality my method possesses lies in the particular mode of combined approach advocated, which, from an experience of eight years, I believe to possess special advantages. On referring to the late Mr. Alwyn Smith's method of approach, I find certain fundamental differences between his method and mine, which must be immediately obvious to anyone who compares the two methods and accompanying diagrams. For instance, Mr. Alwyn Smith advocated *two separate incisions*, the posterior of which is *vertical*; and his method of opening the posterior part of the joint capsule differs from mine. Also in my method, the semicircular flap permits the internal lateral ligament to be freely exposed and this structure acts throughout the delicate operation as an exceedingly helpful surgical landmark. When Mr. Platt states that the procedure described by me is "familiar to most orthopædic surgeons in this country," I presume that he is referring in a *general*

way to the "combined anterior and posterior approach" and not to the special method that I describe. Otherwise, it is a little difficult to understand why a method with which orthopædic surgeons are apparently so familiar has not hitherto been published for the benefit of the profession generally.

I am, Sir, yours faithfully,

A. G. TIMBRELL FISHER.

Montagu-square, W., Jan. 10th, 1932.

LOSS OF MEMORY.

To the Editor of THE LANCET.

SIR,—Almost every day one meets in the lay press accounts of the disappearance of individuals, generally of the male sex, accompanied by the statement that such individuals are believed to be suffering from loss of memory. In your issue of Jan. 2nd a most detailed account of a genuine case of such a condition, with its treatment and outcome, is described. It is interesting to note that in this particular case the police were at first extremely sceptical, and regarded the condition as pure malingering. In this opinion they were doubtless influenced by the fact that within the previous five years one of the authors in the present case had been consulted on three occasions by them in cases of supposed loss of memory, all of which had turned out to be simulation.

That genuine cases of loss of memory do occur is patent, but would appear to be extremely rare. The matter is one of marked medico-legal importance, and it would be of great interest to hear of the experiences of other practitioners with this type of case. It is only on such evidence that an estimate of the true prevalence of genuine cases can be established, and such separated from what must be spurious cases reported almost daily in the press.

I am, Sir, yours faithfully,

H. B. NEWHAM, M.D.

London School of Hygiene and Tropical Medicine, Keppel-street, W.C., Jan. 8th, 1932.

WHY ARE MEDICAL BOOKS WRITTEN?

To the Editor of THE LANCET.

SIR,—You begin a leading article in your issue of Jan. 2nd, entitled "The Literature," by saying that "a sign of the times is the growth of an immense literature (so-called) at every point where scientific progress is being made." I am moved to ask—why are medical books written? This question must arise very frequently in the minds of the medical booksellers who are supplied with catalogues by the various publishing firms. The bookseller sees on the one hand a long and elaborate "Handlexicon," and "Arbeitsmethoden" from Germany, and on the other the loose-leaf text-books of medicine, surgery, &c., from America, or the small and insignificant pamphlet-like books on "recent advances" from England. The meditative bookseller on receiving copies of these works and turning them over in the slack periods must wonder what object the authors had in view. Perhaps the most astonishing authors and publishers are those from Germany. The vast and expensive "systems" or "methods," running in some cases into hundreds of Lieferungen and dozens of volumes, make it difficult for the ordinary person, be he publisher, medical man, or general reader, to appreciate the aim of production. It is impossible to believe that the mere making of money was the object of these serious works, since it is well known that a semi-medical text-book, to be sold "to the medical profession only," on, say, modern technique in marriage, will achieve the fortunes of the publisher and author much more rapidly and with considerably less effort. It is also puzzling to know from where the money comes to publish these very expensive works, as we are told that Germany is financially ruined and yet it is the only country able to produce such volumes. Another type of book which must puzzle the retailer is that on some abstruse subject written by an unknown and junior man. There is, however, a belief that when a young man qualifies and obtains a position on the staff of a hospital as a registrar, the writing of a book would do him a great deal of good. He therefore writes a book, and, through the influence of one of his seniors or possibly a wealthy relative, persuades the publisher to produce it for him. Undoubtedly the work involved in looking up the original literature, if he bothers to do this, will have benefited the author, but too often the result is such as to make everyone wonder why such a work was published.

Then there is another type of book, that produced by the enthusiast who begs, borrows, or saves the money to produce a monograph explaining his views on, let us say, the treatment of cancer or tuberculosis. This type of work is easily detected by our wondering medical bookseller and is put aside on the shelf, in the knowledge that it is extremely doubtful whether a solitary copy will ever be sold.

Then, again, there is the type of book produced by careful and clinical authors with the cold-blooded object of making money, either directly through the sales or indirectly through the oblique advertisement. Many of the volumes in this catalogue are very useful productions and are greeted with pleasure by the book salesman.

On an infinitely higher plane there are a very few books which have been written because the author or authors wished to present a subject in its completeness and entirety in such a way that the work would stand for ever as a perfect summary and presentation of the views which were held at that time. The author of such a work produces it for the same reason, we should imagine, as Milton produced "Paradise Lost," not from any personal motives of gain either in the direction of finance or of scientific notoriety. It is a remarkable fact that such works are usually a failure from a speculative point of view. It is considered unwise to refer to a living book, but the dead may be mentioned without there being any suggestion of indirect publicity. Two such deceased books come to the mind of the writer, and by "deceased" is meant out of print. Firstly, there is Schafer's "Text-book of Physiology." One would have thought that this work would have sold out edition after edition, and been the standard English text-book on physiology. There can be no doubt that had it been published in Germany by some well-known German house it would already have run into many editions and been followed by a long string of grandchildren in the form of Ergänzungsbänden. As it stands at present only one edition has been published, and that in 1899 and 1900; yet to the discriminating view it is still the great text-book on physiology and biochemistry. The second book is Allbutt and Rolleston's "System of Medicine," one of the only successful systems of medicine published by English authors. This again

has been out of print for very nearly 20 years, though it is the cherished possession of all who wish to obtain authoritative information on clinical signs, symptoms, and differential diagnosis. It is only natural that both of these works are out of date when considered from the present-day point of view, yet there is barely a single word which those who love these works would like to see cut out in a new edition—one would like to see them added to, but not cut down.

It is a long time since anything of so great an importance in English medical literature has appeared on the horizon, but last week's LANCET gave a review of a work by one who may be a newcomer to the list of English classics. Dr. Needham's "Chemical Embryology"[1] in three volumes has been produced through the desire to present a complete account of this subject in the English language, and that he has done so there can be no doubt. His book, like a well-cut diamond, presents many facets; it possesses great literary charm and distinction, great learning, valuable historical material and, at the same time, elaborate and detailed biochemical material. It is surprising to find a biochemist writing on embryology. The morphologists, both gross and microscopical, will surely tremble to see what they must have considered their strongest rampart broken down and crossed by the forerunner of an invading horde of, to their mind, foreigners. One can imagine His and Von Graefe turning in their graves at the thought of embryology passing from the hands of the morphologist into those of the biochemist. The younger generation has grown impatient of the cutter of sections and the reconstructor of embryos. Admittedly, these workers by the results of their labours may be able to explain how a very rare congenital cardiac malformation may occur, but in the dealing with this they have, of course, not the slightest interest except to obtain nicely injected museum specimens; or, on the other hand, their researches enable a physician to give a clinical lecture on the embryological basis of cleft palate and harelip. All these vaunted advantages for the knowledge of embryology can only strike the practical therapeutist as belonging to the irritating phenomena of being wise after the event. Dr. Needham's work must bring a great flood of enthusiasm into the study of embryology from an entirely new aspect. This work is heartily recommended to all professors of anatomy who torture their students with details concerning the closure of the pleuro-peritoneal openings, since here they will find a constructive and progressive science as compared with one of almost archæological interest.

I am, Sir, yours faithfully,

Jan. 12th, 1932. DODDERER.

PREVENTIVE MEDICINE IN ITS RELATION TO AVIATION.

To the Editor of THE LANCET.

SIR,—May I be permitted to call attention to a statement liable to misinterpretation in my article on this subject in your last issue? In a sentence concerning the disposal of excreta (p. 112) I do not wish to imply that the Air Ministry regulations permit the dropping of excreta from the air. On the contrary, they forbid it.

I am, Sir, yours faithfully,

E. GOODWIN RAWLINSON, M.D.

Russell-square, W.C., Jan. 9th, 1932.

[1] Chemical Embryology. By Joseph Needham, M.A., Ph.D. Cambridge. At the University Press. 1931.

A SOURCE OF ERROR IN MEASUREMENTS OF URINE SECRETION.

To the Editor of THE LANCET.

SIR,—Drs. Kerridge and Ellis (THE LANCET, Jan. 9th, 1932, p. 83) have fortified the old-fashioned obstinacy of those of us who have long felt examination of the "twenty-four hour specimen" of urine to be a better clinical guide than any *ad hoc* "renal efficiency" test. But surely they are in error in suggesting that in "the prone position" micturition incompletely empties the bladder. Usually, of course, micturition in bed takes place in the *supine* position.

I am, Sir, yours faithfully,

Jan. 8th, 1932. CAVILLATOR.

OBITUARY

TOM BIRD, M.R.C.S., M.A. Oxf.

WE regret to announce the death, which occurred on Jan. 3rd at his residence at St. Margaret's-on-Thames, of Mr. Tom Bird, consulting anæsthetist to Guy's Hospital and the East London Hospital for Women.

Mr. Tom Bird, who was born in 1844, was educated privately, and entered Oriel College, Oxford, in 1862. He graduated in Arts but never joined the medical school, proceeding to Guy's Hospital, and taking the diploma of M.R.C.S. in 1869, at which date, and for long after, the single qualification was sufficient for the purpose of registration. He entered general practice, but being appointed anæsthetist to his old hospital he gradually became a specialist along this line, lecturing in the medical school and instructing the students at Guy's in his subject. He later became also anæsthetist to the Dental Hospital of London, the Hospital for Women in Soho-square, and the East London Hospital for Women, and obtained wide professional popularity as an administrator.

We owe to the courtesy of Mr. C. H. Golding Bird (not, by the way, a relative) the following note on Mr. Tom Bird as a professional colleague:—

"The recollection of Mr. Tom Bird as an anæsthetist, that I retain, has always been a pleasant one, for both privately and professionally he was a gentleman of unfailing courtesy. Quiet, refined—one may add dignified—in his manner, he at once impressed his patient with confidence, whilst the surgeon with whom he worked always felt that in his hands there was no undue anxiety in regard to his patient. His were the days of chloroform, ether, and A.C.E., and none of the present-day drugs of refinement in anæsthetics, or complicated appliances, were in use, so that, if possible, more care in the administration of the anæsthetic was then required of the administrator than at present. Tom Bird never took risks, and always warned the operator if he felt that the border-line of safety was being neared; on the other hand, he was by no means an over-anxious or hesitating administrator. He was much valued at Guy's as a teacher; he impressed his pupils by his manner, and never spared trouble in explanation and demonstration, always, however, exacting from them the closest attention to every detail. He was therefore much valued on the teaching staff, and nothing but the lapse of years caused his resignation, a matter of great regret both to his colleagues and the students he so well instructed."

A correspondent, a personal friend of Mr. Tom Bird, writes: "A few remarks on Tom Bird may be

(*Continued at foot of next page.*)

PUBLIC HEALTH SERVICES

LONDON COUNTY COUNCIL.

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH FOR 1930.

BETWEEN the closing of office hours on the evening of March 31st and the morning of April 1st, 1930, 76 hospitals and institutions, containing over 42,000 beds and a staff of nearly 20,000, were transferred to the public health department of the London County Council. Prior to that date they had been administered by the late Metropolitan Asylums Board and the 25 Metropolitan Boards of Guardians, and thereafter they constituted one great hospital service under central direction and control.

In his first report [1] on the work of the hospitals and institutions transferred to the Council, Sir Frederick Menzies gives some account of how this great task was achieved. The basis of the smooth transference was the realisation that changes of procedure should not be too hastily made. Much preliminary work had been done in anticipation of the change, and many conferences had been held; meetings of medical superintendents, matrons, and stewards had been convened, and six months before the appointed day the head office staff had been strengthened by the appointment of a matron-in-chief and three principal medical officers. During the course of the year, it has been necessary to appoint four senior medical officers in the General hospitals division, and one (divisional) medical officer was newly appointed to assist the principal medical officer of the Special hospitals division.

One of the earliest major problems which faced the department was the difficulty in obtaining nurses, whether qualified or probationer, to fill vacancies as they arose. Consideration was next given to the best way of examining various important matters on which comprehensive reports would eventually have to be submitted to the Central Public Health Committee. It was decided to try experimentally the appointment of departmental committees representative of all the interests concerned to act in an advisory capacity; the first five committees appointed considered the treatment of tuberculosis, forms and records, the ambulance service, medical supplies, and pathological laboratory facilities respectively.

[1] Vol. IV. (Part I.), Public Health. Report on the Hospitals and General Medical Services under the Control of the Central Public Health Committee. London: P. S. King and Co. 1931. Pp. 207. 2s. 6d.

(*Continued from previous page.*)

interesting to your readers, for he had long outlived most of his professional contemporaries. Bird, outside his professional work, lived in the typical environment of mid-Victorian society. He had a small private practice, most of his patients being his friends or their relatives, and to these he was a wise and considerate adviser. He had a very attractive manner and appearance, and was popular in Mayfair and Bohemia. As a young man he had been a good oar—he was captain of his college boat club—and an adept skater. Until advanced life he had consulting rooms in Conduit-street, where he saw patients by appointment, but for several years he had entirely retired from practice and lived in the country. He will be missed by many of his juniors, especially at the United University Club where he was an habitué."

DEPARTMENTAL COMMITTEES.

The experiment proved successful and later committees were appointed on hospital standards; on the staffing of transferred institutions; on junior medical appointments; on appointments to the intermediate grades of nursing staff (above staff nurse and below assistant matron) and of school nurses; and to the senior grades of domestic staffs. The personnel of all these committees is described; some of them included experts on the subjects under consideration not in the service of the Council.

One of the most important perhaps from the point of view of hospital management throughout the country is that on *hospital standards*.

The terms of reference were: to consider what general standards, if any, should be adopted for the structure, equipment, and maintenance, including staffing and methods of heating, lighting and ventilation, of the public hospitals of London; and to consider also what hygienic standards, if any, should be adopted for the institutions, homes, or poor law schools transferred to the Council under the Local Government Act, 1929.

The members of the Committee are: *London County Council:* Dr. W. A. Daley (Chairman); Dr. W. Brander; Dr. J. A. H. Brincker; Dr. H. Nockolds; Dr. W. T. Gordon Pugh; Mr. R. Robertson; and Mr. F. R. Hiorns. Mr. R. Coleman (Secretary). *Ministry of Health:* Dr. Seymour and Mr. Scott. *Director of Central Bureau of Hospital Information:* Mr. R. H. P. Orde.

It is believed to be the first body representative of architectural and medical opinion set up in this country to study scientifically the problems of hospital construction and administration. After a preliminary study of existing conditions in hospitals at home and abroad the Committee considered such matters as air and bed space standards, and the best lay-out of wards for the acute sick, maternity cases, children's sections and isolation units. A plan was also prepared of a model operating theatre unit. Its recommendations are provisional at present, but are placed on record as a basis of discussion. Various types of ward accommodation and plans have been prepared to illustrate suitable lay-outs of ward blocks for different types of cases.

The Committee also considered carefully the question of standardising certain items of hospital furniture and equipment; its work is likely to extend over a considerable period of time.

To the Departmental Committee on *Forms and Records* was entrusted the task of considering what were the most suitable books, forms and records to be kept in, or in connexion with, the transferred hospitals, including not only medical case-papers and all forms relating to medical work, forms for admission and discharge, notice to patient's friends, but also statistical returns. One outcome of the deliberations of this Committee was the decision to use mechanical tabulation in the Council's hospitals. Some of the interesting results obtained from the returns thus compiled are appended to the report, and the possibilities for statistical investigation are obviously greatly increased by the adoption of uniform records.

The standard form of card used is reproduced, black spots indicating the position of punched holes, which correspond with the entries on the card.

The cards are entered up from the case-papers at

each hospital and are sent to the statistical branch of the public health department at County Hall, where they are punched, for tabulating purposes, and are passed through a counting machine. This machine, a four-column sorting counter, will count the number of holes punched in each of four columns at the rate of 20,000 cards per hour. If, for instance, if it is desired to know how many patients were treated in the various types of ward, how the patients were admitted, how they were discharged, and the reason for their discharge, the machine would be set to count on certain columns. If, in addition, the wards, for instance, were required to be examined separately in respect of other data, the machine would be set to sort on column 14, in which numbers 0 to 6 correspond respectively to maternity, mental and observation, venereal, tuberculosis, isolation, general medical, and general surgical wards, and would deliver the cards in separate packs for each class of ward.

The standard procedure, adopted in the Council's general hospitals is that bed cards are kept at the head of the patient's bed, but clinical notes are kept in the charge of the ward sister; prescriptions and diets are entered on the bed card, so that the case papers need never leave the wards. While for statistical material prepared for the service as a whole rigidity is unavoidable, considerable elasticity is allowed in the type of printed forms used by individual hospitals. A form of report for the information of the school medical service upon elementary school-children treated in the general hospitals has been adopted by the Committee.

The Committee on the *Staffing of Transferred Institutions* reported a consensus of opinion that the services of consultant staff should be freely available for the patients in the Council's hospitals, but laid down no definite policy in regard to the best method of employment of such staff. Consideration was given in this connexion as to how the Council's hospital service could best assist in the provision of well trained and experienced medical men as private practitioners. The Committee believe that owing to the difficulty of obtaining resident appointments in the teaching and other well-known hospitals, some men and women enter private practice immediately after qualification without the advantage of residence in a hospital; they recommended that so far as possible resident house physicians or house surgeons or clinical assistants (non-resident) should be employed at all the general hospitals in order to provide opportunities of hospital experience.

They recommended that candidates for the post of assistant medical officer should have already held a resident hospital appointment, and that besides a good general knowledge of institutional work they should have begun to take a special interest in some particular branch. In order to prevent the retention of mediocrity in the service, it was strongly recommended that appointments to the grade of assistant medical officer should be for a limited period, which, it was suggested, should be for not more than four years. At the end of this service the appointment of an assistant medical officer should be terminated unless he had applied for inclusion in, and had been accepted for the "promotion list"—i.e., a list of names of those considered suitable for and awaiting vacancies in the grade of senior assistant medical officer. It was further recommended that provision should be made for a free interchange of medical staff between all the hospitals.

The remuneration suggested by the Committee for a medical superintendent ranged from £900 with varying maxima to £1650, together with an unfurnished house.

THE COUNCIL'S ADMINISTRATIVE SCHEME.

In framing an administrative scheme the Council endeavoured as far as possible to provide that the transferred services should be merged in the Council's existing organisation and allocated to the committees of the Council to which they were appropriate.

Having regard to the varied character of the cases dealt with at the several institutions under its control and the manner in which the accommodation for such cases was distributed, the Council felt that it would not be desirable, even had it been practicable, to earmark particular institutions for specified purposes, and that any attempt to do so would seriously prejudice the formulation of a scheme for reclassifying and otherwise dealing with the transferred institutions. Before any such scheme could be prepared, it would have been necessary for a complete survey to be made of the existing buildings and the nature of the accommodation thereat. The Council was, however, in agreement with the principle enunciated in Section 5 of the Local Government Act, 1929, as to the desirability of making arrangements for the full exercise of the powers under the special Acts at the earliest possible date. It therefore decided to include in the administrative scheme a general declaration that it was the intention of the Council that, as soon as circumstances permitted, all assistance which could after April 1st, 1930, be provided either by way of poor relief or by virtue of any of the special Acts mentioned, other than the Maternity and Child Welfare Act, 1918, should be provided exclusively by virtue of the appropriate special Act, and not by way of poor relief. This would be in accordance with one of the main objects of the Act—to secure that as soon as practicable the existing duplication of powers should be brought to an end, and that each form of assistance should be in the hands of one, and not more than one, branch of the Council's organisation.

As regards the administration of the Maternity and Child Welfare Act, 1918, the position in London is complicated owing to the fact that the City Corporation and the metropolitan borough councils are the authorities under the Act. The Council proposes to give further consideration to this whole matter at a later stage.

Central Public Health Committee.—A very considerable part of the transferred work fell within the purview of the Public Health Committee, the membership of which was enlarged; members who were not members of the Council were coöpted and the reconstituted Committee was designated "The Central Public Health Committee."

The Committee deals, inter alia, with the provision, classification, maintenance, and management of hospitals for the sick, other than mental hospitals, and arranges for their visitation, and assumes responsibility for a number of children under 3 years of age formerly in the receiving homes and schools of the guardians.

For the purpose of hospital administration, the county was at first divided into five areas. Later this division was abandoned, but the preparation of statistics for this volume was already well advanced, and this early classification is retained in presenting some of the statistics and other information given in this report.

The questions involved in the separation of the able-bodied poor from the sick, especially in view of

the varying degrees of sickness, were found very difficult of settlement, and before coming to any conclusions it was found desirable to attempt a definition of what was meant by "the sick." For this purpose it was considered convenient to divide all persons receiving medical and nursing attention in the poor-law hospitals and mixed institutions into the following classes :—

(1) Patients needing continuous medical or surgical treatment (acute sick) ;
(2) Patients needing institutional treatment because they are suffering from some chronic disease, also aged and infirm persons requiring medical and nursing attention (chronic sick) ;
(3) Maternity patients (excluding infants) (acute sick) ;
(4) Mental patients (acute sick) ;
(5) Healthy infants (under 3 years of age), excluding those in the maternity wards.

For the accommodation of the acute and chronic sick it was considered desirable that two types of hospitals should be recognised—viz., hospital "A" for the acute sick and hospital "B" for the aged and infirm and those suffering from chronic disease.

Acute sick.—Examination of statistics of patients in relation to the number of beds available in hospitals in various areas led to the conclusion that although a central administration of all the hospital beds and rearrangement of accommodation would, it was anticipated, bring about a higher average occupation generally, yet the available accommodation for the acute sick would be inadequate for future needs.

Chronic sick in mixed institutions.—The types of inmates in the mixed institutions included :—

(1) Aged persons who are up and about ;
(2) Aged persons and others who are suffering from debility, chronic bronchitis, chronic rheumatism, chronic heart and arterial disease, and chronic kidney disease, &c. ;
(3) Paralysis cases ;
(4) Cancer cases ;
(5) Mental defectives and epileptics.

It was difficult among this heterogeneous mass of chronic sick, aged, and infirm persons, to define accurately the degree of infirmity or disability that places a person in the category of the "sick."

The Administrative Scheme did not place under the direction of the Committee any institution of the mixed type, but with the concurrence of the Public Assistance Committee, it was agreed that 12 institutions with accommodation for over 2500 should be allocated as hospitals to provide for the "chronic sick."

The proposed allocation left, for the time, accommodation for "healthy" cases (approximately 2770) in the hospitals under the Central Public Health Committee, and accommodation for "chronic sick" (approximately 5120) in the institutions under the direction of the Public Assistance Committee. In order to allow time, which may be considerable, for reorganisation and reclassification, the agreed allocation was regarded as provisional only.

(To be concluded.)

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 2ND, 1932.

Notifications.—The following cases of infectious disease were notified during the week :—Small-pox, 54 (last week 32) ; scarlet fever, 1579 ; diphtheria, 910 ; enteric fever, 40 ; pneumonia, 2139 ; puerperal fever, 20 ; puerperal pyrexia, 105 ; cerebro-spinal fever, 33 ; acute poliomyelitis, 6 ; acute polioencephalitis, 1 ; encephalitis lethargica, 7 ; dysentery, 15 ; and ophthalmia neonatorum, 92. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Jan. 5th–6th was as follows : Small-pox, 82 under treatment, 8 under observation (last week 75 and 1 respectively) ; scarlet fever, 1329 ; diphtheria, 1510 ; enteric fever, 7 ; measles, 664 ; whooping-cough, 431 ; puerperal fever, 16 (plus 11 babies) ; encephalitis lethargica, 224 ; poliomyelitis, 2 ; "other diseases," 272. At St. Margaret's Hospital there were 20 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there were no deaths from small-pox, 1 (0) from enteric fever, 47 (14) from measles, 1 (1) from scarlet fever, 48 (11) from whooping-cough, 42 (3) from diphtheria, 81 (22) from diarrhœa and enteritis under two years, and 240 (53) from influenza. The figures in parentheses are those for London itself.

Eight of the cases of measles were reported from Manchester and 6 from Stoke-on-Trent. Whooping-cough caused 8 deaths in Birmingham and 6 in Liverpool. Eleven of the fatal cases of diphtheria were in Hull and 5 in Liverpool. Diarrhœa and enteritis accounted for 7 deaths in Liverpool, 6 in Manchester, and 4 in Cardiff. Of the deaths attributed to influenza, 17 were in Manchester and 11 each in Birmingham and Liverpool.

The number of stillbirths notified during the week was 289 (corresponding to a rate of 44 per 1000 total births), including 46 in London.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Jan. 19th.—5.30 P.M., General Meeting of Fellows. 8.30 P.M., PATHOLOGY. Papers : Dr. J. W. S. Blacklock : The Primary Lung Focus of Tuberculosis in Children. Dr. Dorothy Russell : Tumours of Ependymal Origin. Dr. Oliver Heath : Serum Changes in the First Week of *B. typhosus* Immunisation.
THURSDAY.—5 P.M., DERMATOLOGY (Cases at 4 P.M.). Cases : Dr. Norman Burgess : 1. Case for Diagnosis. ? Lupus Erythematosus. Dr. F. Knowsley Sibley : 2. Seborrhœic Warts and Superficial Rodent Ulcers (shown previously). Sir Ernest Graham-Little : 3. Multiple Erythematoid Benign Epithelioma. 4. Xanthoma Diabeticorum. Dr. John Franklin : 5. and 6. Two Cases of Adenoma Sebaceum. Dr. A. Burrows (for Dr. O'Donovan) : 7. Hereditary Tylosis with General Ichthyosis, Squamous Carcinomata, and Paget's Disease. Other cases will be shown. 8.30, NEUROLOGY : Presidential Address : Dr. Stanley Barnes : A Myopathic Family with Hypertrophic, Pseudohypertrophic, Juvenile and Distal Forms at Different Stages.
FRIDAY.—5 P.M., DISEASE IN CHILDREN (Cases at 4.30 P.M.). 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. Paper : Dr. N. Howard Mummery : Some Aspects of Industrial Medicine.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland-place, W.
THURSDAY, Jan. 21st.—8.15 P.M., Dr. C. M. Wenyon, F.R.S. : Leishmaniasis and the Problem of its Transmission. (Demonstration at 7.45 P.M.)

HUNTERIAN SOCIETY.
MONDAY, Jan. 18th.—9 P.M. (at the Apothecaries' Hall, Water-lane, E.C.), Prof. von Eiselsberg (Vienna) : How Rontgen has helped in Modern Surgical Diagnosis (Hunterian Lecture).

CHELSEA CLINICAL SOCIETY.
TUESDAY, Jan. 19th.—8.30 P.M. (at the Hotel Rembrandt, Thurloe-place, S.W.), Mr. Guy C. Pollock (*The Morning Post*) and Sir Squire Sprigge (Editor of *The Lancet*), will open a Discussion on Medicine and the Press. The meeting will be preceded by dinner at 7.30 P.M.

EUGENICS SOCIETY.
TUESDAY, Jan. 19th.—5.30 P.M. (at the Rooms of the Linnean Society, Burlington House, W.), Eugenics and Party Politics. Speakers : Representatives of Different Political Parties.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, Jan. 18th, and following WEDNESDAY and FRIDAY.—5 P.M., Sir Arthur Keith : Malformations of the Human Body from a New Point of View.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL, University-street, W.C.
TUESDAY, Jan. 19th.—5.15 P.M., Dr. R. A. O'Brien : Preparation Testing and Use of Antitoxin.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
INTENSIVE WEEK.
MONDAY, Jan. 18th.—2.15 P.M., Mr. Kenneth Walker: Some Points in the Diagnosis and Treatment of Urinary Calculi. 3.15 P.M., Mr. W. B. Gabriel: Surgical Ward Cases.
TUESDAY.—2.15 P.M., Mr. F. D. Saner: Selected Cases. 3.15 P.M., Mr. A. M. Zamora: Endoscopic Methods and Treatment.
WEDNESDAY.—2.15 P.M., Dr. Bernard Schlesinger: Demonstration in Children's Ward. 3.15 P.M., Dr. Henry C. Semon: Diseases of the Buccal Mucosa.
THURSDAY.—2.15 P.M., Mr. Eric I. Lloyd: Pseudocoxalgia. 3.15 P.M., Mr. G. G. Penman: Injuries to the Eye.
FRIDAY.—2.15 P.M., Dr. P. O. Ellison: Pathological Investigations. 3.15 P.M., Dr. Claude Gouldesbrough: Fractures.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.
SUNDAY, Jan. 17th.—10.45 A.M., Dr. W. J. Adie: Early Symptoms of Common Nervous Injuries. 11.45 A.M., Mr. L. R. Broster: Head Injuries.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Jan. 19th.—5 P.M., Dr. G. B. Dowling: Seborrhœa. Seborrhœic Dermatitis.
THURSDAY.—5 P.M., Dr. I. Muende: Pathology Demonstration.

ST. MARK'S HOSPITAL, City-road, E.C.
THURSDAY, Jan. 21st.—4.30 P.M., Mr. W. B. Gabriel: The Elucidation of Rectal Symptoms.

UNIVERSITY COLLEGE, Gower-street.
TUESDAY, Jan. 19th.—5 P.M. (in the Physiology Theatre), Mr. H. R. Ing, D.Phil.: Chemotherapy (first of six weekly lectures).

GUY'S HOSPITAL, London Bridge, S.E.
MONDAY, Jan. 18th.—5 P.M., Prof. J. M. W. Morison: The Use of X Rays in Physiological Investigations (first of eight lectures).

ST. THOMAS'S HOSPITAL, Albert Embankment, S.E.
MONDAY, Jan. 18th.—5.30 P.M. (in the Governor's Hall), Prof. W. J. Tulloch: Serological Studies on Vaccinia (first of three lectures).

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Jan. 21st.—9 P.M., Mr. H. Edwards: Minor Surgery.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Jan. 22nd.—4 P.M., Mr. C. Gill-Carey: Rhinological Aspects of Asthma.

ST. PETER'S HOSPITAL, Henrietta-street, W.C.
WEDNESDAY, Jan. 20th.—3 P.M., Mr. J. Swift Joly: Examination of Urological Patients.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Jan. 20th.—4 P.M., Sir William Willcox: Ætiology of Rheumatism, with Special Reference to Infective Causes.

ROYAL MATERNITY AND WOMEN'S HOSPITAL, Glasgow.
WEDNESDAY, Jan. 20th.—4.15 P.M., Dr. S. J. Cameron: Obstetrical Cases.

FACULTY HALL, St. Vincent-street, Glasgow.
TUESDAY, Jan. 19th.—4 P.M., Prof. C. Browning: Serological Tests and Their Significance.

Appointments

Certifying Surgeons under the Factory and Workshop Acts: Macintyre, T. G., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S.G. (Tobermory, Argyll); McShane, C., M.D., Ch.B. Belf. (Barking, Essex); Middleton, G. P., M.B., Ch.B. Edin. (Ballater, Aberdeen); Lakin, F. H., M.B., Ch.B. Aberd. (Burghead, Moray); Richard, F. L., M.B., Ch.B. Glasg. (Walsall); and Williams, J. (Richmond, York).

Vacancies

For further information refer to the advertisement columns.

Beckenham, Kent, Bethlem Hospital, Monks Orchard.—Res. H.P. At rate of £150.
Birmingham, City Mental Hospital.—Sen. Asst. M.O. and Deputy Med. Supt. £550.
Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.
Bristol Royal Infirmary.—Hon. Gynæcological Reg.
Cardiff Royal Infirmary.—Two H.P.'s and Two H.S.'s. All at rate of £50.
Cambridge, Papworth Village Settlement.—Third Asst. M.O. £200.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Dreadnought Hospital, Greenwich.—Hon. Dermatologist.
Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £150.
Glasgow Corporation.—P.H. Dept. Pathologist. £800.
Hampstead General and N.W. London Hospital, Haverstock-hill, N.W.—H.P. At rate of £100.
Harrogate General Hospital.—H.P. £150.
Harrogate Infirmary.—Sen. H.S. £150.
Hertford County Hospital.—H.P. At rate of £150.
King Edward Memorial Hospital, Ealing.—Jun. H.S. £150.—*L.C.C.*—Sen. Asst. M.O.'s for Hospital Service. Each £500.
Leeds Hospital for Women.—H.S. At rate of £100.
Leicester, City Mental Hospital, Humberstone.—Second Asst. Res. M.O. £400.
Liverpool and Samaritan Hospital for Women.—Hon. Asst. Surgeon.
Liverpool, David Lewis Northern Hospital.—Four H.S.'s and Two H.P.'s. Each at rate of £100.
Liverpool Eye and Ear Infirmary.—Ophth. H.S. £120.
Manchester City.—Asst. Tuber. O. £650.
Manchester, Radium Institute.—Asst. M.O. At rate of £400–£500.
Manchester, St. Mary's Hospitals.—Four H.S.'s and Jun. Asst. M.O. All at rate of £50.
Manchester, Withington Hospital.—Asst. M.I. £300.
Mile End Hospital, Bancroft-road, Mile End, E.—Asst. M.O. £350.
National Hospital, Queen-square, W.C.—Hon. Surg. Asst.
Newcastle General Hospital, Newcastle-upon-Tyne.—Res. Med. Assts. Each at rate of £150.
Northampton General Hospital.—Hon. Ophth. Surgeon.
Queen's Hospital for Children, Hackney-road, E.—Surg. to Ear, Nose, and Throat Dept.
Retford, Notts, Rampton State Institution for Mental Defectives.—Fourth M.O. £400.
St. Alfege's Hospital, Vanbrugh Hill, Greenwich, S.E.—Asst. M.O. £350.
St. John's Hospital, St. John's Hill, S.W.—Asst. M.O. £350.
St. Mark's Hospital for Cancer, Fistula, and Other Diseases of the Rectum, City-road, E.C.—H.S. At rate of £75.
St. Mary Abbot's Hospital, Marloes-road, Kensington.—Asst. M.O. At rate of £250.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—Anæsthetist. £25.
Sheffield, Children's Hospital.—H.S. and Cas. O. At rate of £80.
Sheffield Royal Infirmary.—Ophth. H.S. At rate of £80.
South London Hospital for Women, Clapham Common, S.W.—Surg. Reg. 50 guineas. H.S. At rate of £100. Also Anæsthetist 10s. 6d. per attendance.
Swindon and North Wilts Victoria Hospital.—Res. M.O. £125.
Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. H.S. At rate of £150.
West London Hospital, Hammersmith-road, W.—Non.-Res. Cas. O. £250. Also Hon. Obstet. Reg.
Windsor, King Edward VII. Hospital.—H.S. At rate of £100.
Worcester General Infirmary.—Jun. Res. M.O. £120.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Petersfield (Hants), Hoddesdon (Herts), Malvern (Worcs.), Pontrhydygroes (Cardigan), Shaftesbury (Dorset), Bexhill (Sussex), Lyndhurst (Hants), Modbury (Devon), Alresford (Hants), and Cranborne (Dorset).

Workmen's Compensation Act: Medical Referee for Wolverhampton (Circuit 25). Applications should reach the Private Secretary, Home Office, Whitehall, not later than Jan. 30th.

Births, Marriages, and Deaths

BIRTHS.

AMOR.—On Jan. 8th, at The Cottage, Clydach, Swansea, the wife of Arthur J. Amor, M.D., of a daughter.
WARNER COLLINS.—On Jan. 9th, 1932, at Chartfield, Putney, S.W., to Leona, wife of Dr. Warner Collins—a daughter.
EDMONDSON.—On Jan. 5th, at Dalkeith House, Clarendon-place, Leamington Spa, the wife of Dr. Edmondson, of a son.
SHACKLE.—On Jan. 5th, the wife of J. W. Shackle, M.R.C.S., L.R.C.P., of Ardanoir, Purley Bury Close, Purley, of a son.
WIGHT.—On Jan. 3rd, the wife of Cecil H. Wight, M.C., M.R.C.S., L.R.C.P., of Wangford, Beccles, of a son.

MARRIAGES.

WILLIAMS—PRATT.—On Jan. 9th at St. Stephens, Lewisham, Harry Bowen Williams, M.D. (Brux.), M.R.C.S., L.R.C.P., of Brockley, S.E., to Cassie Ethel Pratt, M.R.C.S., L.R.C.P., of Bexley Heath and Jerningham-road, New Cross, S.E.

DEATHS.

GREVES.—On Jan. 12th, following an operation, Edwin Hyla Greves, M.D., F.R.C.P., of Rodney House, Bournemouth. Funeral service at St. Michael's Church, Bournemouth, on Friday, the 15th, at 2 o'clock.
PRICE.—On Jan. 8th, at Guernsey, Spital-road, Maldon, Henry James Price, F.R.C.S., London, aged 77.
VAUGHAN.—On Jan. 5th, in London, Colonel Joseph Charles Stalke Vaughan, I.M.S., C.I.E.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

UNIVERSITY OF LONDON MEDICAL GRADUATES SOCIETY.—An afternoon meeting of this society will be held at the London School of Hygiene and Tropical Medicine, on Thursday, Jan. 21st, at 4 P.M., when demonstrations and films will be shown and tea will be served. All medical graduates of the University are invited, whether members or not. Tickets are obtainable from the hon. secretaries of the society at 11, Chandos-street, W.1.

MEDICAL NEWS

Royal College of Surgeons of England.

Forthcoming lectures at the College begin with six by Sir Arthur Keith on Malformations of the Human Body considered from a New Standpoint. These will be given at 5 P.M. on Mondays, Wednesdays, and Fridays, from Jan. 18th to 29th. The other Hunterian lecturers are Mr. J. P. Hosford on Some Factors in the Causation of Hydronephrosis (Feb. 1st); Mr. R. T. Payne, on Excretion Urography (Feb. 3rd); Dr. Remington Hobbs, on Puerperal Sepsis (Feb. 5th); Dr. J. A. Ryle, on the Natural History of Duodenal Ulcer (Feb. 8th); Prof. H. A. Harris, on the Comparative Anatomical Aspect of the Prenatal, Infantile, and Adult Disease in Man and Animals (Feb. 10th and 12th); Prof. W. Le Gros Clark, on the Structure and Connexions of the Ophthalmic Thalamus (Feb. 17th and 19th); and Dr. A. J. E. Cave, on the Morphological and Functional Anatomy of the Human Cervical Spine (Feb. 22nd). As we have already announced, Mr. Wilfred Trotter will give the Hunterian oration on Monday, Feb. 14th, at 4 P.M. All the other lectures mentioned are at 5 o'clock

University of Liverpool.

At recent examinations the following candidates were successful:—

D.P.H.

A. Ashworth, Elizabeth M. Harding, R. L. McMorris, J. S. Mather, W. J. Pierce, J. H. Pottinger (with distinction), and A. J. Walsh.

British Medical Association: Scholarships and Grants in Aid of Scientific Research.

The Council of the British Medical Association is prepared to receive applications for *Research Scholarships* as follows: an Ernest Hart Memorial Scholarship, of the value of £200 per annum, and three Research Scholarships, each of the value of £150 per annum. These Scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including State Medicine) relating to the causation, prevention, or treatment of disease. Each scholarship is tenable for one year, commencing on October 1st, 1932. A scholar may be reappointed for not more than two additional terms, and is not necessarily required to devote the whole of his or her time to the work of research, but may hold University or other appointments, provided the duties do not interfere with his work.—*Grants:* The Council of the Association will receive applications for Grants for the assistance of research into the causation, treatment, or prevention of disease, when preference will be given to applicants who propose as subjects of investigation problems directly related to practical medicine. Applications for these Scholarships and Grants must be made not later than Saturday, May 21st, 1932, on a form, supplied on application to the Medical Secretary of the Association, B.M.A. House, Tavistock-square, London, W.C.1. They must be accompanied by the names of three referees, competent to speak to the capacity of the applicants for the researches proposed.

Society for Relief of Widows and Orphans of Medical Men.

A quarterly court of the directors of this society was held in London on Jan. 6th, with Mr. Warren Low, the president, in the chair, and three new members were elected. The death of one of the widows was reported. She had been in receipt of grants since 1897, and had received a total of £3100. Her husband was elected a member of the Society in 1856 and died in 1897, having paid some £52 in subscriptions. A sum of £1695 was voted for the half-yearly grants, to be distributed among the 49 widows and six orphans in receipt of grants, and a further £112 10*s.* as special grants to five orphans over the age of 16—at which age the ordinary grants cease—to enable them to continue their education. The expenses of the past quarter were about £88. It was decided that at the next court the best means of making the society better known should be thoroughly discussed, since many medical men, it was stated, are unaware of its existence. Membership is open to any registered medical man who at the time of his election lives within 20 miles of Charing Cross. The annual subscription ranges from 2 to 4 guineas, according to the age of the member at the time of his election. Relief is granted only to the widows and orphans of deceased members. Further particulars may be had from the offices of the society at 11, Chandos-street, Cavendish-square, W.1, where the secretary attends each Wednesday and Friday between 4 and 5 P.M.

London School of Hygiene and Tropical Medicine.

Dr. James Fenton, medical officer of health for Kensington, has been appointed an additional lecturer on public health administration and practice, and Mr. L. W. G. Malcolm, conservator of the Wellcome Historical Medical Museum, to be a lecturer on racial hygiene. Both appointments are honorary.

King Edward's Hospital Fund for London.

The King has sent a contribution of £1000 to the Fund, being his annual subscription.

The Prince of Wales, as President of the Fund, has appointed the following new members of the Hospital Economy Committee: Miss Margaret Bigge, Dr. Hugh Thursfield, and Commander Alfred Williams.

Royal Microscopical Society.

At the annual meeting of this society, to be held at the B.M.A. House, Tavistock-square, London, W.C., at 5 for 5.30 P.M., on Wednesday, Jan. 20th, Prof. R. Ruggles Gates, F.R.S., will give a presidential address on Nuclear Structure.

Hunterian Society.

Prof. A. von Eiselsberg, of Vienna, will deliver the Hunterian lecture of this society at a meeting at the Apothecaries' Hall, Water-lane, E.C., at 9 P.M. on Monday, Jan. 18th. The annual dinner will be at the May Fair Hotel on Thursday, Feb. 11th.

Post-graduate Lectures on Sundays.

Because of the success of previous courses it has been decided to hold another post-graduate course at Charing Cross Hospital Medical School on Sundays from Jan. 17th to March 20th. Two lectures are given each day, at 10.45 and 11.45 A.M. On Sunday next Dr. W. J. Adie will open the series with an address on Early Symptoms of Common Nervous Diseases, and Mr. L. J. Broster will speak on Head Injuries. A fee is charged for the course, and application should be made to the secretary of the School, 62, Chandos-street, London, W.C. 2.

Royal Sanitary Institute.

A health exhibition will be held at Brighton from July 11th to 16th in connexion with the annual congress of this institute. The exhibits will be concerned, among other things, with sanitary appliances, baths, and lavatories; lighting, heating, decoration and furnishing of the home; bread, milk, and other foods and beverages; hospital appliances and labour-saving devices; apparatus and appliances used in municipal administration; water-supply; disinfectants; and soaps. The address of the institute is 90, Buckingham Palace-road, London, S.W. 1.

British Empire Cancer Campaign.

Sir John Bland-Sutton, vice-chairman, presided at a quarterly meeting of the Grand Council last Monday. The following grants were approved: £3000 to the Middlesex Hospital for six months; £1500 to the Cancer Hospital (Free) for six months; £150 to Dr. Thomas Lumsden; £75 to Miss Goulston; and £17 10*s.* to Dr. H. P. Bayon.—The Council received a report from the joint committee of representatives of the campaign and the Mount Vernon Hospital nominating Dr. A. E. Barclay, lecturer in medical radiology in the University of Cambridge, to the radiological research fellowship founded by Sir William Morris at the Mount Vernon Hospital.—A memorandum from the National Radium Fund was submitted to the Council asking the coöperation of the campaign in a policy of confining radium treatment to those radium centres in provincial hospitals selected and approved by the National Radium Commission. It was reported that a recent questionaire drawn up by the Central Bureau of Hospital Information showed that there are three principal groups dealing with radium at the present time: King Edward's Hospital Fund for London, administering radium to the hospitals within the metropolitan area; the National Radium Commission, administering radium outside the metropolitan area; and an independent group of over 100 centres established in hospitals of 50 beds and upwards in England, Scotland, and Wales, controlling approximately 16·8 g. There is also a considerable quantity of radium owned privately by surgeons in the country. The Grand Council resolved to coöperate as far as practicable in helping the National Radium Fund with its policy of radium distribution so that every part of the country shall be adequately served, and that radium for therapeutic purposes shall be in the hands only of those well qualified to use it.—Mr. C. H. Fagge was unanimously elected a member of the Grand Council.

NOTES, COMMENTS, AND ABSTRACTS

DEAFNESS AND ITS PREVENTION.*

BY MAURICE SORSBY, M.D. LEEDS, F.R.C.S. EDIN.,

SURGEON, EAR, NOSE, AND THROAT DEPARTMENT, PLAISTOW CHILDREN'S HOSPITAL; ASSISTANT SURGEON, EAR, NOSE, AND THROAT DEPARTMENT, LONDON JEWISH HOSPITAL; REGISTRAR, EAR, AND THROAT DEPARTMENT, GUY'S HOSPITAL.

HEARING and vision are the two senses which give man information of the visitant world. Taste, touch, and muscle-sense tell man only of things with which he is in immediate contact, and smell, though a sense for information for remote objects, does not serve him greatly in that capacity. The world of the person who is both deaf and blind is pitifully small. The deaf-blind moves in the larger world, but is not of it.

The tragedy of blindness is widely recognised, because the disabilities of blindness are frequently brought home to normal people when they find themselves in darkness. But deafness strikes no cord of sympathy. Yet the deaf are at the very least as handicapped as the blind, for deafness is isolation and utter loneliness in a large world the joy of which springs from social contact. The deaf much more than the blind are thrown on to their own resources. Gregariousness, the most precious of joys, is denied to them. They stand outside the pale. The blind can join the melée of life. The deaf always move in isolation.

Helen Keller, herself blind, deaf and dumb, rates the horror of deafness above that of blindness. "The problems of deafness" she says, "are deeper and more complex, if not more important, than those of blindness. Deafness is a much worse misfortune. For it means the loss of the most vital stimulus—the sound of the voice—that brings language, sets thought astir, and keeps us in the intellectual company of man."

Partial deafness is a much greater disability than partial blindness, and the lesser degrees of auditory defect are much more crippling to social and individual value than the lesser degrees of visual defect. Decline in vision will certainly handicap a man in specialised work for which full visual acuity is necessary, but decline in hearing hinders social life and every-day duties.

If the problem of deafness is as urgent on the individual side as that of blindness, it is equally urgent as a social problem, for deafness and auditory defect take as large a numerical toll as blindness and visual defect. Statistics with any approach to accuracy are not available for the general population, but the figures supplied by the school medical service for 1927 are of interest.[1] Thus there were in England and Wales, 1925 totally blind children, but over twice as many totally deaf children, namely 4038. In the case of partial defect, the proportions are reversed: as against 4929 partially blind, there were 2053 partially deaf children. The extent of minor auditory defect is far greater than is generally imagined, though it is not so great as that of minor visual defect. Thus, repeated examinations at schools reveal some degree of visual defect in about 45 per cent. of children. The extent of auditory defect seems to vary with the type of school population.[2] It is generally given as about 25 per cent. of children. Thus, Barr (Glasgow, 1890) found it to be 27·66 per cent.; Bezold (Munich, 1885), 25·8 per cent., and Denker (Erlangen, 1906), 23·3 per cent., figures which agree closely with the 29·5 per cent. found by Dr. Mable Russell[3] in 1930, in a group of 434 unselected children in the London County Council schools. The extent of deafness in the adult population is unknown, but there can be no doubt it is much higher than the 25–30 per cent. seen in school-children. The problem of the deaf is much larger than is generally imagined.

The Causes of Deafness.

No doubt the majority of cases of partial deafness are due to acquired causes. Analyses of available statistics concerning children whose hearing is sufficiently defective to require their attendance at a deaf school shows that acquired causes are responsible for a proportion varying between 35 to 75 per cent. (see Table I.).

TABLE I.—*Showing Proportions of Congenital to Acquired Deafness in Schools for Deaf Children.*

Source.	Deaf children examined.	Born deaf.	Acquired.	Unknown.
		Per cent.		
Glasgow Institution for the Deaf (Kerr Love)[1]	214	52·8	44·5	2·3
National Institute of the Deaf (1928)[1]	2946	56·0	35·0	9·0
Amer. Annals of the Deaf[1]	4649	44·0	44·0	12·0
(American) National Research Council[4]	5348	62·3	—	—
L.C.C.[5]				
1909–17.. ..	1863	35·1	60·0	4·9
1919–28.. ..	1630	24·7	68·0	7·3
1929–30.. ..	277	21·7	75·1	3·2

The conflicting nature of the figures in this Table is no doubt due to the different standards employed by different bodies for the admission of children to deaf schools. The relatively low proportion of children born deaf in the L.C.C. figures is due to the care bestowed by the L.C.C. on the partially deaf children by admitting them to the special schools. For the understanding of the possibilities in the prevention of deafness it is necessary to analyse the causes in greater detail.

CONGENITAL DEAFNESS.

A child born deaf may be the victim of frankly hereditary forces or of an obscure lesion. Hereditary deafness is assumed when the family history points in that direction; sporadic congenital deafness when no such influence is obvious. Aphasia is responsible for a small number.

The relative proportion of hereditary to sporadic deafness varies with different statistics. The L.C.C. figures for 1919–1928 report 83 true hereditary deaf against 305 sporadic deaf-born. The line of division between the two is not always easy. The existence of a deaf relative, or even of a deaf parent, is no proof that the new-born child is the subject of hereditary deafness; nor, paradoxical as it sounds, is the absence of deafness in the parents evidence that the deafness is not hereditary, for the parents may be carriers of deafness without themselves being deaf. It is the family history extending to many generations, with undisputed evidence of deaf-mutism, that constitutes conclusive evidence of true hereditary deafness. It is more than possible that some forms of deafness in adults have a familial tendency, but the predisposition to deafness developing in adult life is something distinct from deafness at birth, with its consequent dumbness.

The problem of hereditary deaf-mutism was sharply focused in 1883 by Graham Bell, in his classical memoir on "The Formation of a Deaf Variety of the Human Race."[6] Bell pointed out that, of the "2262 congenital deaf-mutes, more than half, or 54·5 per cent., had deaf-mute relatives; and in the case of those pupils who became deaf from apparently

* Presidential address, London Jewish Hospital Medical Society.

accidental causes, 13·8 per cent. had other members of their family deaf and dumb." Owing to the constant intermarriage between deaf-mutes, and the fact that the speaking and hearing members of such families often have deaf-mute children, Bell foresaw a deaf variety of the human race. From an analysis of the deaf-mute population of the United States, from the end of the 18th till the latter part of the 19th century, he concluded that the congenital deaf-mutes were increasing at a greater rate than the general population.

Sporadic congenital deafness offers an even more baffling problem than true hereditary deafness. The appearance of one child born deaf in a family with a clear and good history is not easily explained. In all probability a variety of causes underlie this manifestation. Kerr Love [6] held that a certain proportion were syphilitic in origin. Others are, no doubt, really hereditary, the deafness being in all probability a recessive character making a rare appearance owing to being linked with other features. The exact pathology, whether it is of cortical or labyrinthine origin, is still unknown, and Macleod Yearsley [7] has drawn attention to a connexion of certain cases of congenital deafness with otosclerosis, a hereditary condition which manifests itself after birth.

In all forms of congenital deafness, treatment is, of course, useless, and the problems presented by the two varieties is different. True hereditary deafness is a problem of eugenics; sporadic congenital deafness is a problem of pathology.

ACQUIRED DEAFNESS.

The proportion of acquired deafness is infinitely greater than is suggested by the percentages in the deaf schools. For, in addition to the deafness to which children are prone, there is deafness supervening in adult life and in old age.

Deafness in Childhood.—Valuable information about the cause of acquired deafness in children is shown by the L.C.C. reports. The 1117 children with acquired deafness seen at the County Hall during 1919–27 showed the following causes [8]:—

Disease of the nervous system	.. 10·6	per cent.
Infectious and Infective diseases	.. 28·3	,, ,,
Primary ear disease and injuries	.. 61·15	,, ,,

Meningitis, usually of unknown origin, was responsible for almost all the deafness in the first group; 29 out of the 116 cases were due to epidemic cerebro-spinal fever, sporadic cases were contributed by other fevers, but the greatest number (55) were due to meningitis of unknown cause. Deafness in these cases is due to infection spreading to the internal ear and destroying it.

Of the infectious and infective diseases, with their toll of 28·3 per cent. of acquired deafness in children, measles and scarlet fever are responsible for the greatest number of cases, the former being slightly in excess. Congenital syphilis was responsible for a small proportion (70 cases), but the declining incidence during the past ten years is worthy of note, the annual numbers being 11, 12, 9, 7, 6, 9, 5, 7, 3, 1.

By far the largest group is that due to primary ear conditions, with its percentage of 61·15. Practically all (676 cases out of 682) were due to middle-ear affections of a septic nature, and only six were caused by otosclerosis. Injuries were responsible for a small group (34 cases, or 3·04 per cent.) of all acquired cases.

Deafness in Adult Life.—If the deafness of children is mainly septic in origin and tubo-tympanic in type, that of adults is a most puzzling problem. Many cases are due to the same causes operating in children, namely, middle-ear infections, either due to nasopharyngeal sepsis, or caused by a blood-borne infection. Many others are but the progressive manifestations of mild forms contracted in childhood, but probably the majority are caused by an ill-defined group of diseases for which a great variety of names have been supplied, otosclerosis and chronic progressive deafness amongst others. The characteristic of this group is that apart from the fact that the onset of the deafness supervenes in adult life, it is difficult to determine the exact lesion in these cases. Tubo-tympanic infection may or may not be present; the evidence in favour of a nerve lesion is often inconclusive. Often there is a familial basis, and usually the condition is progressive. The proportion of this group of cases due to non-definable causes is given in vastly different figures by different observers

Deafness in Old Age.—Senile deafness is nerve deafness. It can hardly be a pure atrophy for it is not a constant feature when other atrophic processes of old age are present. How far auto-intoxication and arterio-sclerosis play a part is unknown. Senile deafness per se is probably as much a myth as senile blindness.

Treatment and Prevention of Deafness.

There is an old adage about there being two types of deafness: one (curable) is due to wax in the external ear; the other (incurable) is sent to the aurist. Fortunately this pessimistic teaching is not true. Lesions of the middle ear, besides those of the external ear, are amendable to treatment to quite a considerable degree, even if not to a dramatic extent, though lesions of the inner ear are beyond treatment. The most that can be done for internal ear deafness is to check further ravages; the many efforts, such as the Zünd-Burguet apparatus, which aim at re-education, are of no value.

But all types of deafness are more easily prevented than cured, and the efforts at the prevention of deafness cover the whole field of biological activity.

CONGENITAL DEAFNESS.

The true hereditary deaf offer a totally different problem from the sporadic deaf-mutes. Hereditary deafness presents a problem of eugenics of the same type as other hereditary defects. A better appreciation of the type of inheritance and a smaller regard for the liberty of the subject are necessary for the eradication of these social dangers. The breeding of biologically inferior types at a time when the social conscience protects them in the struggle of life, is a problem fraught with momentous issues for the welfare of the race. This is not a chimerical fear when it is remembered that in England and Wales alone there are estimated to be about 40,000 deaf-mutes, and that they and many of their hearing relatives are potential breeders of a much larger group. It must also be remembered that many of these are blind in addition to being deaf-mutes. What this means in human terms is brought out in this newspaper report quoted by Kerr Love:

> "At an inquest yesterday, on Wm. Earnshaw, aged 59, a St. Pancras sadler, it was stated that the relatives could not identify the body, as the wife and sister were both blind and deaf, and the four children were deaf and dumb. The deceased was deaf and dumb, and was so when he married."

As opposed to true hereditary deaf-mutism, sporadic deaf-mutism is a problem in pathology. We are powerless to take any effective action until more is known. Our present position is that sproadic deaf-mutism is an accident that can happen to the best of families.

ACQUIRED DEAFNESS.

It cannot be emphasised too strongly that most deafness is partial and acquired. In so far as deafness affects an individual standing by himself, there is no question of racial welfare involved. But, unfortunately, many cases of acquired deafness are familial—i.e., there is a germinal defect and not merely a somatic defect. Of that large group of cases developing during adult life and not due to infection, a great proportion is due to otosclerosis, which has a strong familial tendency. These cases are as truly hereditary as congenital deaf-mutism, though unfortunately both the diagnosis and our knowledge of the hereditary characteristics of the disease leave much to be desired. But by far the

largest numbers of deaf loose their hearing through infectious fevers and though primary middle-ear infection, and it is along these lines that preventive measures can be most successful.

Infectious Fevers bring deafness in three ways. By a spreading infection of the nasopharynx—acute otitis media and all its complications including acute mastoiditis, may be set up. A blood-borne infection may similarly affect the middle ear. The third way is destruction of the internal ear from meningitis, caused by the fever, typically seen in cerebro-spinal meningitis, but not uncommonly seen in measles, scarlet, diphtheria and other fevers. Destruction of the internal ear gives complete deafness and is a rapid process; affections of the middle ear generally subside without permanent damage, but if neglected may go on to chronic middle-ear disease and all its dire consequences. The control of infectious fevers and skilled aural attention when complications are present have done much to diminish the frequency of deafness from these causes.

Primary Middle-ear Infection stands out as the most common cause of deafness. It is responsible for an endless amount of minor auditory defect, and is being tackled energetically by the school medical service. By far the great majority of these infections originate in the nasopharynx, secondary to infected tonsils and adenoids. The extensive operations on these organs are definitely reducing the toil of middle-ear infection, though much yet remains to be done, especially for the pre-school child. Otorrhœa is diminishing in incidence among school children, and the number of children noted as hard of hearing at medical inspections in L.C.C. Schools has almost been halved in the last three years (L.C.C. report, 1930). The extensive service organised by Dr. A. G. Wells for the treatment of otorrhœa cases has shown the way for the effective treatment of established conditions threatening hearing and life itself, just as the organisation for the removal of naso-pharyngeal sepsis is eliminating the most important primary cause of deafness.

Deafness and otorrhœa are largely diseases of neglect. Kerr Love has stressed the associations of these conditions and overcrowding at home with all its implications. Statistics collected in three schools of different types bear this out, as shown in Table II.[2]

TABLE II.

School.	Children examined.	Number deaf.	Number having otorrhœa.
Rugby School (Duke)	1000	26	2
Whitechapel area (Ivens)	1006	about one-fifth	72
Hanwell Poor-law (Cheattle) ..	1000	more than half	88*

* 355 showed evidence of past infection.

Even admitting that a different standard may have been used at the different schools, the object lesson remains reinforced by other evidence. Middle-ear infections and their consequent deafness are largely preventable.

Deafness, like blindness, is caused by a multitude of diseases, but both are largely the result of sepsis. The great causes of blindness were small-pox, trachoma, and ophthalmia neonatorum. These three powers of darkness have been practically stamped out in this country. The great causes of deafness are likewise septic processes, middle-ear infections, and destruction of the internal ear from the infectious fevers. It may be beyond the resources of modern otology and epidemiology to stamp out nasopharyngeal infections and the infectious fevers, but much has been done and more still can be done. Within the province of the general practitioner lies the early infection of the middle ear. Many if these infections need never occur if the nasopharynx of the healthy child is not allowed to become a centre of latent sepsis. When the conflagration in the nasopharynx has started and has spread to the middle ear, it is well to remember that it is not a minor condition which is being dealt with, but an insidious threat to hearing and even to life. Much marring of life can be prevented, and much happiness brought about by the prevention of the development of the acute ear, and when that catastrophe has occurred, by preventing it from becoming a chronic menace or an irremediable calamity.

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WILLIAM HARVEY AND ABERDEEN.

To a recent issue of the *Aberdeen University Review* some interesting notes on Harvey are contributed by Dr. William Clark Souter, lecturer in ophthalmology in the University of Aberdeen. These notes form part of a communication made to the Aberdeen Medico-Chirurgical Society in connexion with the Harvey Tercentenary of 1928, and are now published by the Aberdeen University Press.

Dr. Souter first deals with a visit to Aberdeen by Harvey in 1641 when the position of Honorary Burgess was conferred upon him, as well as on Adrian Mitcalff, apothecary to the King, and Alexander Midletun, the sub-principal of King's College. The spelling of the names, obviously faulty, follows the Latin entry in the roll of the city burgesses. The reason of Harvey's visit to Aberdeen is a matter of conjecture, but it was probably paid in connexion with the projected union of the two Colleges, King's and the Marischal, a union which received the Royal Assent in 1641, but ceased to exist on the passing of an Act, which was later repealed after the downfall of Charles I.

Dr. Souter is interesting in his remarks on the Aberdeen portrait of Harvey, the complete history of which is not definitely known. The portrait, which is reproduced in the Review, came into the possession of the Aberdeen Medico-Chirurgical Society in 1815, being the gift of Sir Walter Farquhar, himself a Royal physician who attended King George III. in his mental illness. The assumed date of the portrait is 1645, but it has no signature attached and its origin is doubtful. Harvey was often painted, and Dr. Souter suggests that, apart from the fact that he was the Royal doctor, a reason may be found for his frequent portraiture in the fact that he was employed by King Charles I. to buy pictures for him when travelling on the continent, and that this exercise of his critical faculty brought him into contact with artists at home and abroad who reproduced his attractive features.

THE TOOTH-BRUSH.

UNDER the title "The Tooth-brush: Is it IT or is IT not?" Mr. J. Menzies Campbell, the author of a popular guide[1] to the conservation of teeth, has contributed to the *Dental Surgeon* of Dec. 12th, 1931, an article which in a brief space contains much sound doctrine. While recognising the tooth-brush as merely an unnatural method of trying to right the wrongs of unnatural feeding, he describes the kind of brush which will do the least harm to the gums and teeth. "In my opinion," he says, "for general use a 'child's size' tooth-brush is best. The handle should be curved and the bristles, of not too hard a texture, arranged in a saw-like manner, with

[1] Those Teeth of Yours. Second edition, revised and enlarged. By J. Menzies Campbell, D.D.S., L.D.S., F.R.S.E. London: William Heinemann, Ltd. 1931. Pp. 147. 3s.

sufficient space between the tufts, which should be wired to the framework—cemented bristles are a danger." He points out that dental floss and even the fine tooth-pick may find a place in the hygiene of the teeth, as proved by their scavenging results. But he points out that the public should receive instruction in using both these adjuvants and the tooth-brush itself, for lack of right methods may cause erosion of the enamel and, by irritating the gingivæ, lower the local resistance and thus hasten the onset of pyorrhœa alveolaris. How far this occurs frequently seems to be uncertain.

CAUSES OF EXCLUSION FROM SCHOOL.

AN interesting analysis of the numbers of children absent permanently or for long and short periods from school is included in the annual report for 1930 of Dr. H. Leslie Cronk, medical officer of health for Hampshire. He says in an introductory note:—

The survey of the health of children attending elementary schools in Hampshire shows clearly enough their conditions as regards dental decay, defective eyesight and hearing, and such deformities and defects which are not sufficient to prevent a child attending school. This makes a very imperfect picture, and leaves out all the ailments which are sufficiently severe to keep a child from school, and also those seemingly trivial but really somewhat important ailments from which children recover, and which leave no distinct signs to an inspection at school later on. To obtain a truer view of what health the children of this county enjoy, these two classes of ailments need to be reviewed. These words are of general application, for surveys of this kind should form an essential part of the study of the health of the elementary school-children of any area.

In Hampshire there are 44,506 children on the school register, and the average attendance is 40,415—that is, the average number of absentees is 4091.

Group I.: 231 children were permanently excluded from school for the following causes: 81 mentally defective; 15 blind; 29 deaf; 14 epileptic; 5 tuberculous; 1 suffering from deformity, 1 from respiratory disease, 6 from other diseases. In these lists children from 5 to 16 are included; without counting those above 14, the numbers would be much smaller, especially for the blind, deaf, and epileptic; and, apart from these groups and the mentally defective, there would be only 23 children permanently excluded from school.

Group II.: 400 children were absent from school for over three months at a time, equivalent to an average loss of 165 days throughout a year. The causes were:—

Disease.	Cases.	Weeks lost.
Infectious diseases	66	1137
Debility	53	1037
Rheumatic conditions	48	1199
Diseases of respiratory tract	47	964
Suspected tuberculosis	36	1038
Injury	28	538
Skin diseases and ringworm	27	485
Ear disease and mastoiditis	18	398
Appendicitis	11	192
Eye diseases	8	177
Diseases of genito-urinary system	6	108
Other conditions	42	995

The figures for infectious diseases were affected by a severe epidemic of measles. The amount of absence for suspected tuberculosis is high. It is noted that these figures do not imply "a large incidence of clinical tuberculosis among children." As a preventive measure, a certain number of ailing children, contacts of tuberculous patients, are received for treatment.

Of the 48 children said to be suffering from rheumatic conditions, 18 were suffering from chorea, and 12 from heart disease. It would be interesting to know how far this loss of attendance would be reduced in an area where there was a fully organised rheumatic scheme. Dr. Cronk says that in Hampshire the cases are so scattered that supervision by special clinics appears impracticable. He believes that the provision of a convalescent home where education can be given might be useful and might prevent sequelæ, but it would necessarily be costly. The cases of injury occur most in boys of 7 and 8, a fact which is interesting in relation to the Safety First campaign. Ringworm accounts for a number of long absences, owing to the lapse of time before obtaining the treatment by X ray provided.

In *Group III.* (absences of one week to three months; ages 11 to 14 inclusive) the outstanding feature is the loss of time due to respiratory diseases.

The numbers of absentees in Groups II. and III. were notably lower in schools where milk was given, and in general the provision of milk markedly reduced the loss of school attendance.

THE PRESCRIPTION OF GLANDULAR PREPARATIONS.

THE failure to differentiate between fresh and desiccated gland in prescribing glandular remedies may lead to ineffective dosage. In a booklet on Glandular Products and Their Doses, Mr. H. W. Paines, M.P.S., gives useful advice about this. For ten years he has been engaged solely in dealing with these preparations, and he finds that the confusion in the minds of practitioners is getting worse. When thyroid was first introduced the fresh gland from the sheep was given, minced, in its raw state. The first clinical experiments having been made with fresh gland, this scale of dosage was carried on when tablets containing desiccated gland were introduced, and these were prescribed in terms of the equivalent amount of fresh gland. The alternative is to prescribe them in terms of the actual preparation used. Instead of writing: Thyroid fresh gland gr. i, one may prescribe thyroid siccum, gr. 1/5; and in the opinion of Mr. Paines this is greatly to be preferred. The five names in common use are thyroid, thyroid fresh gland, thyroid gland, thyroid extract, and thyroid siccum. Pharmacists often have difficulty in interpreting what is meant by some of these, and unless the last is employed the patient may get five times or one-fifth of the dose intended. Mr. Paines commonly finds tablets in use with a totally inadequate dosage, and he lays down the rule that all glandular products should be prescribed in terms of the dry gland only. At the end of his booklet, which is obtainable from Messrs. Paines and Byrne, Ltd., 31, Southampton-street, London, W.1, he gives a table showing the "minimal therapeutic dose" of a number of glands and the usual maximal dose employed. This table would be of more value if he had eliminated those substances of which the therapeutic value in any dose is quite unrecognised. He does not offer comments on the activity of the preparations, but this clearly varies within wide limits.

ERRATUM.—In an article on Early English Drug Jars, published in THE LANCET of Dec. 26th, p. 1441, the word "*caudle* cups" was misprinted "candle cups."

NATIONAL COUNCIL FOR MENTAL HYGIENE.—In association with the Howard League for Penal Reform this council has arranged a series of lecture-discussions on the Psychologist's part in the Prevention and Treatment of Crime. They will take place at the rooms of the Medical Society of London, 11, Chandos-street, W., at 5.30 P.M. on Wednesdays from Feb. 10th to March 16th. The series will start with a lecture by Mr. George Ives on Penal Methods Past and Present, after which the next two speakers will be Dr. T. S. Good, on Crime and Mental Abnormality, and Dr. E. B. Strauss on the Borderline Case. Tickets may be had at the doors or from the secretary of the Council at 78, Chandos House, Palmer-street, S.W.1.